JOURNAL OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS

THIRD SERIES

VOL 41. No. 16 — 7 JULY 1934

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JOURNAL OF THE
ROYAL INSTITUTE *of* BRITISH ARCHITECTS

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Journal

The London Architecture Medal for 1934 has been awarded to Messrs. Welch, Cachemaille-Day and Lander, for St. Saviour's Church, Eltham. This was illustrated in the R.I.B.A. JOURNAL on the 14 October 1933. It is interesting to recall Sir Reginald Blomfield's appreciation of this building in *Modernismus*, a book in which much modern architecture met with short shrift, but of St. Saviour's he says in "that strange and impressive church at Eltham . . . . the Architects have broken right away from the ecclesiastical tradition of church-building, yet the building is obviously a church and not a factory, and they have not broken away from the tradition of architecture, for this church reminds me of that grim and splendid church at Albi."

The tablet to the memory of Sir Mervyn Macartney was unveiled by Sir Giles Gilbert Scott in the crypt of St. Paul's Cathedral on the evening of Thursday, 28 June. A short service was conducted by Dean Inge, assisted by the Archdeacon Canon Alexander and Canon Mozley. Sir Giles, in unveiling the tablet, referred to Sir Mervyn Macartney's work as an historian and as the surveyor responsible for the great work of reconditioning the fabric of the cathedral. His special knowledge of the Wren period well qualified him to undertake the responsible task, which had now been so admirably completed. Sir Mervyn owed much to Christopher Wren, and also, Sir Giles suggested, did Wren owe much to Sir Mervyn's labours and the labours of those who worked with him, without which Wren's great epitaph, "si monumentum requiris, circumspice," might have lost its significance and become even a sinister and sarcastic comment. The tablet was designed by Mr. Godfrey Allen, Sir Mervyn's successor, and was executed by Mr. Laurence Turner. Among those present at the ceremony were Lady Macartney, Miss Macartney, Mrs. Hall, Mrs. Coventry, Lord Russell of Killowen, Lord Ritchie of Dundee, Sir Alexander Gibb, Mr. Reid Dick, Mr. Guy Dawber, Mr. Walter Tapper, Mr. H. M. Fletcher, Mr. Arthur Keen, and Mr. W. Godfrey Allen.

Among the many minor but interesting pieces of work which are being done preparatory to the move to Portland Place is the disposition of the R.I.B.A.'s fine collection of Presidential portraits about the new building. It is seldom realised, even by members of the Institute who are constantly in and out of No. 9 Conduit Street, how varied and interesting and indeed how good is the large collection of paintings which the Institute has gathered during the past century. There are, first of all, the thirty-four Presidential portraits which include as the masterpieces Sargent's magnificent genial deification—if it may be so described—of F. C. Penrose and Orchardson's suave picture of Alfred Waterhouse. Alma-Tadema, who had painted Whichcord's portrait several years previously, in unveiling the Penrose portrait, which we now regard with such justifiable enthusiasm, said: "To have a portrait of such a President must be a pleasure to all; to have such a good portrait was a matter of much gratification to the subscribers" and added that the Institute was getting such a "nice collection" that it should consider building a special gallery to hold it. We do not know if Tadema's suggestion about a gallery was ever given more consideration; the portraits, however, are so intimately bound into Institute history that it would surely have been wrong to relegate them merely as "works of art" to a saloon dedicated for ever to sightseers and not to allow our Past Presidents the cynical delight of looking down through their portraits on the daily activities of their successors in Council Chamber, vestibules and Committee Rooms.

Beside the Presidential portraits there are many others of note. Fine contemporary portraits of Robert and James Adam, of Sir Robert Taylor, of J. L. Bond—whom some say was really the designer of Waterloo Bridge—and of the elder Pugin and many more, including several excellent busts. The committee which has been trying to decide their places in the new building is placing the pictures where they can best be seen by members, and has attempted to pay due regard to all the often con-

flicting interests such as the fame of the sitter, the quality of the painting and the relative prominence and design of the rooms available, and yet to lay down no inflexible law on the matter so that changes can be made easily and often, if need be, in the future.

The use of the existing Institute furniture provides another problem. As far as possible what is good is being used, but much that is shabby and of no great artistic merit may be so closely bound to our history that to jettison it without exploring every possibility of its use would be a sad action to be avoided unless inevitable. And what of the more flippant calls of sentiment? There is the historic council table, now hidden in the basement, from which a large segment was cut in eighteen hundred and —— to allow one of the more portly Presidents to get within reach of his pen and paper! The presence of the pictures and of some of the furniture will be a valuable and tangible link with the past which will enhance the interest of the next hundred years in the Institute's new house.

The fifth list of subscriptions to the New Building Fund is printed below and brings the amount received to over eleven thousand pounds. The excellent response which has been made so far will, it is hoped, be an encouragment to yet more members to contribute in money or kind.

	£	s.	d.
*Brought forward	10,892	11	8
Mr. Edward Bates [*L.*]	2	0	0
Professor Lionel B. Budden [*F.*]	5	5	0
Mr. W. E. Vernon Crompton [*F.*] ..	10	10	0
Mr. E. Ford Duncanson [*L.*]	10	10	0
Mr. Cyril A. Farey [*A.*]	10	10	0
Mr. Horace Field [*F. Retired*]	6	6	0
Mr. Roderick A. Fitton [*A.*]	0	10	6
Mr. R. R. Gardiner [*L.*]	5	5	0
Messrs. Halliday & Agate (C. Gustave Agate [*F.*] and F. Leslie Halliday [*A.*])	2	2	0
Mr. F. Hall-Jones [*F.*]	5	5	0
Mr. George Harvey [*A.*]	1	1	0
Mr. E. Bertram Kirby [*F.*]	5	5	0
Mr. A. Colbourne Little [*F.*]	10	10	0
Mr. E. J. T. Lutyens [*A.*]	1	1	0
The Oldham Society of Architects ..	25	0	0
Lt.-Col. G. Reavell [*F.*]	1	1	0
Mr. J. C. Howard Sandbach [*L.*] ..	2	2	0
Mr. B. Priestley Shires [*F.*]	2	2	0
Mr. Gilbert G. L. Tyte [*A.*]	1	1	0
Messrs. Wigglesworth & Marshall Mackenzie (H. H. Wigglesworth [*F.*] and A. G. R. Mackenzie [*F.*])	2	2	0

* The list published in the last JOURNAL included a promise of 500 dollars (counted as £98) from the late Mr. Cass Gilbert, [*Hon. Corr. Member*]. A cheque for £100 sterling having now been received from Mrs. Cass Gilbert, the additional £2 is included in the amount brought forward.

Total received or promised to 30 June 1934,
£11,0[illegible]2 0s. 2d.

The Grith Fyrd movement is probably the most significant and effective attempt that has yet been made to counteract the psychological evils of unemployment. The Grith Fyrd camps, which were first started experimentally two years ago, are voluntary camps for the unemployed, their principal aim being to provide useful occupation for men who would otherwise have little means of employing the leisure time forced upon them by circumstances. The camps are equipped and organised by means of subscriptions, and maintained by a pooling of the men's unemployment grants, the members of the camp contributing what they can in work and technical knowledge to the community life.

The two camp centres are Godshill, near Fordingbridge, in Hampshire, and Shining Cliff, Alderwasley, in Derbyshire. Though they are in essence "camp communities," in time it is hoped that their temporary buildings will be replaced by more permanent ones. The main building at Godshill is just about to be started, and though the building at Shining Cliff has only reached the planning stage, it is hoped that it will be finished before the winter. The communities belong to the C.P.R.E., and the organisers of the scheme are naturally extremely anxious to avoid unsuitable or unsightly buildings, great stress, for instance, being laid on the necessity for using appropriate local materials for the buildings. The buildings themselves are erected by members of the camps, men who are not experts, and at this stage the supervision of a trained architect possessing a certain amount of technical knowledge and experience would be invaluable. It is possible that there are many young architects at present unemployed who might be willing to give their services, and their co-operation would certainly be most welcome. They would be expected to join the camps in the normal way as ordinary, unprivileged members, making their particular contribution to community life the planning of buildings and the supervision of building operations. It is possible that in the future Government grants will enable more camps to be started. This will entail more building and more experience for any architects participating in the scheme. Anyone in sympathy with the movement, which socially, educationally and psychologically has proved of real value, is asked to write to the organising secretary, Mr. Guy Keeling, at Toynbee Hall, E.1.

In response to numerous suggestions it has been decided to reduce the price of the tickets for the Farewell Dance which is to be held at the Institute on Monday, 16 July from 7s. 6d. to 5s., and to dispense with the proposed cabaret entertainment. Members are reminded that tickets cannot be obtained after Tuesday, 10 July.

The Shakespeare Theatre. Architects: Scott, Chesterton & Shepherd [F. & AA.]. This building shows many examples of the decorative uses of brick, including brick carving (Sculptor, Mr. Eric Kennington). The bricks shown in this photograph are brownish red, hand-made and sand-faced, with some silver-grey bricks mainly above the cornice. Lime mortar was used throughout

MODERN PRACTICE IN BRICKWORK

Volumes could be written on bricks and brickwork. The following article does not attempt to cover the subject, even superficially, but should be regarded as a summary of recent tendencies in design, of developments in manufacture and of some discoveries concerning the technique of brickwork, the last being principally the fruits of investigations by the Building Research Station.

The illustrations are intended as a commentary on the article rather than as an exhaustive demonstration of all recent tendencies or types of brickwork. Moreover, it should be realised that no method of reproduction, including photography, can adequately represent the true effects of brickwork. Nor is it possible to convey by description the colours of bricks.

PART I.—DESIGNING IN BRICK

Nathaniel Lloyd remarks that "Well-made, well-burnt brick has proved the most durable of all building materials, withstanding the elements for many centuries, without deterioration. There is almost no limit to the variety of forms, textures and colours in which brick can be produced, nor to the multitude of ways in which it can be used."*

In the last forty or fifty years architecture has paid increasing attention to the qualities of materials and to

* *A History of English Brickwork.* By Nathaniel Lloyd. P. 53.

the design possibilities inherent in them. This tendency has been strongly marked in bricks and brickwork. The real difficulties encountered by pioneers such as Philip Webb, Lutyens and Ernest Newton in England and Berlage in Holland, in their efforts to obtain bricks that were not uniformly dull or even ugly, and to get them laid other than mechanically, have been largely forgotten. It is, however, entirely due to the insistent demands of these men that such a wide range of good colours, textures and sizes can be obtained to-day.

In England the revival of the brick craft has to a large extent followed traditional lines in attempting to recapture the colours and textures of Tudor and eighteenth-century brickwork. In Holland, where the craft had equally degenerated, the revival has paid more attention to exploiting the very wide range of design possibilities without particular reference to precedent. The work of Dudok is a good example of this. In America the revival has been recent, almost post-war, and although it has to a great extent taken the form of simulating old bricks and even other materials by machine processes, has resulted in providing greater variety in colours and textures than is obtainable in any other country.

In England since the War the influence of the newer Dutch work is affecting practice to an increasing extent. The work of the north German architects, notably Höger, has had a similar influence, but to a smaller extent. England is peculiarly rich in variety of brick-making materials, of which the possibilities are still only partially realised by architects and manufacturers. The recent economic difficulties, by drawing attention to the cheaper materials and forms of construction, have quite definitely encouraged the use of brick. Provided that other methods of construction or other facing materials do not achieve the ends obtainable with bricks, at *less* cost (and there is not much real evidence of this as yet), a much extended use of and attention to design in brickwork seems likely. Moreover, the types of building with which architects are at the present time concerned, namely buildings for the people such as houses, tenements, churches, baths, cinemas, and even municipal buildings, seem more suited to execution in brick than in other materials.

Designing the Brick Wall

Brickwork can only be designed in the mind of the architect; it cannot be shown on drawings. The general appearance of a brick building is enormously influenced by the colour of the brick, or the bond, or by the width, recessing, texture or colour of the joint. The effects obtainable with a given brick can also be similarly varied by change of bond or jointing. This can be observed in a rudimentary form in buildings under construction where joints are raked out preparatory to pointing in a mortar different in colour from that used for bedding; sometimes the pointing does not improve the appearance of the wall. It can, however, be emphasised that there are no golden rules on bonds or on width, colour or recessing of joints; each case must be decided on its own merits. Fashion has had no small influence on jointing. The smooth mechanical jointing of the nineteenth century was to some extent succeeded by the struck joint. Latterly the wiped joint has been favoured for stock and other rough bricks. But no one method of jointing should be regarded as having universal application. Experiment by the building of test panels is almost always worth while. Mere examination of individual bricks, or even stacks of bricks, is almost useless if a real impression of the finished wall is desired. The colours which seemed dominant in a stack of bricks may fail to appear in the finished wall when pointed.

The natural reaction against the pressed brick with its smooth texture and uniform colour, both often hideous, led to the production of rougher textures and irregularities of colour. There is, however, not necessarily virtue in rough textures or mottled colours. These have sometimes been carried to excess by what Professor Goodhart-Rendel has called "the bill-hook party"* though, fortunately, we have not yet seen in this country the exaggerations of "skintled" brickwork in which some American architects are now indulging. On the other hand, the more mechanical-looking rectilineal buildings of to-day seem to demand an appropriate brick technique, though it is by no means necessary to revert to the pressed brick to obtain this result. The brickwork of modern buildings at Hamburg, in which a vitrified clinker brick has been used, seems suitable to both the general appearance and use of the building, as is also the brickwork of such English examples as Battersea Power Station and the Royal Masonic Hospital.

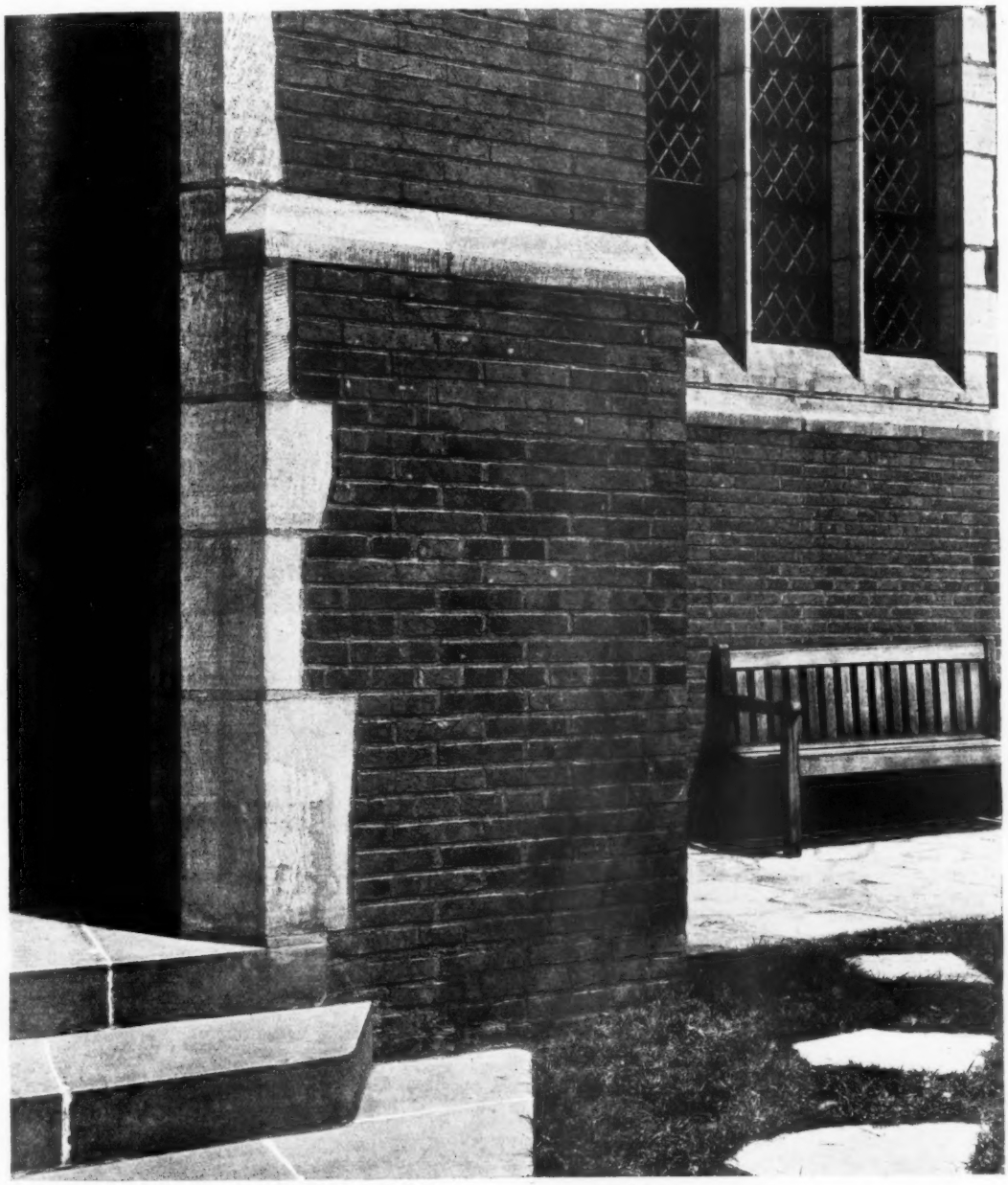
Sir Giles Gilbert Scott recently said† "I should like to see a competition among students for building a plain brick wall. Let them choose the colour, size, texture and bond of the brick and decide upon the width, colour, texture and treatment of the joints, and they would learn not only the extraordinary variety of effects that are possible but how the colours of bricks change with different kinds of joints, and how difficult it is to judge the effect of walling from a few sample bricks in one's hand."

Colours of Facing Bricks

While the colour of facing brick principally used in England is red of varying shades, there is a growing vogue for the lighter buffs and browns. There is, however, a wide range of colours available, particularly in the South of England. In Holland the variation in colour of bricks is not so great, the architects apparently preferring to obtain their design effects by interesting bonds or occasional use of glazed bricks. In the matter of colour, however, the English manufacturers are greatly

* At the R.I.B.A., 21 November 1931.

† R.I.B.A. Presidential Address to Students, 27 January 1934.



The Church of St. Alban, Golders Green. Architect: Sir Giles Gilbert Scott, R.A. An example of slightly recessed, rough textured jointing with two inch bricks. The latter are mainly pale brown with light orange and plum mottling and are used with Clipsham stone dressings. The bond is English Garden Wall bond.

outdistanced by the American. "Urged on by the recent enthusiasm of architects for colour, they have achieved an amazing range of gradation in light shades—white, cream, stone, limestone, grey to match natural stone, stone with "iron spots," fawn, iron buff, golden buff—as well as vivid tints of tangerine, toasted brown, pale greens, reds, blues and purples."*

It is, however, fallacious to believe that a brick will not look well if it is not mottled—a belief that is a natural reaction against the mechanical ugliness of late nineteenth-century work. This has been disproved by Dutch architects, and in England the Royal Masonic Hospital provides an example of good design with a brick of uniform colour. In this last case interest is given to the wall by an unusual bond and the raking-out of joints ; that is to say, pattern and shadow take the place of variety in colour. Had a mottled brick been used the effect might have been confused. An analogy may be sought in the use of marble. It has long been held that figured marbles should not be moulded but used in flat sheets and, conversely, that plain marble should be carved or moulded. In the same way it may reasonably be argued that mottled bricks should be used in broad areas with a simple bond and jointing, and that the more uniform the brick the greater the extent to which use can be made of bond, pattern and jointing.

A brick of which the surface has been coloured by artificial means may retain its colour or it may not. In any case such a brick cannot be cut or even chipped accidentally without the body colour showing on face.

Textures of Facing Bricks

The English hand-made sand-faced brick deservedly retains its popularity. With all their ingenuity the American brick manufacturers have not been able to reproduce exactly its qualities. Machine-made bricks are usually uniform and reliable, particularly when purchased from a reputable maker who can point to buildings in which his product has been exposed to the weather for several years or who will produce a Building Research Station report on it. But the machine-made brick without an established reputation should be regarded with caution, especially when facings are being considered. Poorly-made wire-cuts can laminate badly and the surface skins of cheap pressed bricks have been known to come off. Moreover, the

*Building Research Special Report No. 20.

The Church of St. Anselm, Kennington. Architects : Adshead & Ramsey [*FF.*]. *An example of the use of London stocks in lime mortar. The cornice is of cut stocks. In the right hand bottom corner is a piece of old wall in the same bricks, built in* 1914

The Royal Masonic Hospital, Ravenscourt Park. Architects: Sir John Burnet, Tait & Lorne [FF.] An example of simple design of windows in brick. Special cill and soffit bricks have been used, some of them being 1 foot 3 inches long

weathering qualities (in the sense of improvement in colour with age) of the hand-made brick are well known, whereas those of the machine-made equivalent are not so certain.

The pressed brick still retains its popularity in the north of England where its manufacture has reached a high degree of technical skill. Some of the pressed brick manufacturers are now producing artificially textured bricks in a variety of designs, though, again, the English manufacturers have (perhaps fortunately) not indulged in the excesses of the American, who have "evolved corrugations by mechanically scoring the faces of the brick by nail, comb or wire, by tearing pieces with rotating knives, by stripping the skin and rolling the pieces on again."*

Scale in Brickwork

The use of textured bricks has some relation to the question of scale in design. It can be said that the greater the scale of the building the rougher and coarser the texture of the brick and the brickwork can be.

Texture is, however, by no means concerned only with the individual brick. Much may be learnt from the Americans and Germans of the value of coarse texture in a large, particularly a high, wall surface. In making final decisions on the texture (and colour) of a brick surface it is important not to overlook the questions of the distance from which it will be seen and of the size of the building concerned. There are numerous ways in which the desirable broad effects can be obtained.

The setting in or out of courses of brick on a façade or tower is an old but none the less effective device. This has been recently used in conjunction with a textured Fletton brick on the "Dreamland" building at Margate by Messrs. Iles, and Leathart & Granger; both the roughness of the brick and its use in projecting bands are complementary broad-scale textural effects. The traditional brickwork of Northern Italy affords numerous examples of these effects.

It is the practice of some architects to mix in a wall

*B.R.S. Special Report No. 20.

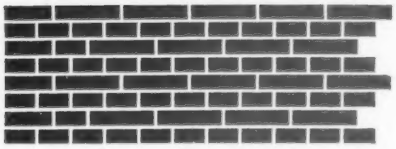


FIG. 1.—DUTCH BOND

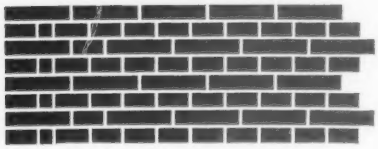


FIG. 2.—ENGLISH CROSS BOND

bricks from two or more brickyards. This gives a colour effect that is larger in scale than is obtainable with a mottled brick. If overdone this use of different manufactures of bricks can be offensive and crude, especially if the batches have different textures or are far apart in tone. If, however, the batches are only slightly different in colour the uniformity of the wall surface is maintained with a large scale variegation in colour.

The practice of mixing bricks, has, however, dangers to the inexperienced. Sizes in hand-made bricks may vary slightly; the soluble salt contents may be different, causing patchy efflorescence; some bricklayers will not take the trouble to mix the bricks properly.

The practice of changing the colour of bricks according to the height of the building, though little known in this country, has at present a great vogue in America. It is not uncommon to see a tall building in which the brickwork changes from black at the base through plum colour, red and orange to bright yellow at the top. Crudely done this can be offensive : but with changes so slight as to be almost imperceptible some pleasant effects can be obtained. In the Church of St. Thomas the Apostle at Hanwell by Mr. Edward Maufe, silver-grey bricks are banded with light buff, the spaces between the bands diminishing according to height so that the top courses consist almost entirely of buff bricks. Here the bricks have a similar texture and the colour variation, though effective, is so slight that the camera does not record it.

FIG. 3.—FLEMISH GARDEN WALL, OR SUSSEX BOND

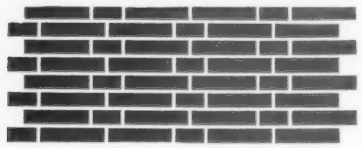


FIG. 4.—BOND USED AT THE ROYAL MASONIC HOSPITAL

FIG. 5.—MONK BOND

BONDS

There is a wide field for research into the bonding of brickwork from the point of view of design. Few architects appear to progress much beyond the old, hackneyed rule, "English for strength, Flemish for appearance." With the use of modern mortars the structural strength of the bond has become less important. While the use of strong cement mortars is by no means to be encouraged (see remarks under "Mortars" later) it does tend to free the designer from the limitations of bonding for strength. In recent Dutch work whole walls have been built of brick on end, or of bricks laid vertically above one another without any bond in the accepted sense; even flat soffits have been faced with brick. Indeed much modern Dutch brick walling looks as if it were a brick pavement set on edge. This free patterning of brick in a vertical face is doubtless logically defensible, particularly where it is merely a skin to a reinforced concrete wall. It is, however, relatively more costly in England than in Holland where the craft of brick patterning is more generally established.

Between the two extremes of plain English or Flemish and the "pavement-on-edge" a great deal of interesting variety can be given to ordinary structural walling. Before some of the more unusual bonds are described it is perhaps necessary to point out that the nomenclature is very loose. Many of the less common bonds are given different names not only in different parts of the country but even in textbooks. It would be useful if the names of many of these bonds—which are growing in popularity—could be settled; possibly this work would come within the purview of the British Standards Institution. In the following descriptions the nomenclature used by Nathaniel Lloyd has been followed except in examples which he does not give.

Two variations of English bond should be noted, namely, Dutch bond (Fig. 1) and English Cross bond (Fig. 2). These are often confused because the general wall face is the same, the difference lying in the quoin treatment. In both, the stretchers break joint giving the bond a pattern of crosses. This may be exploited by the use of bricks of different colour to emphasise the pattern of crosses. In the quoins of English Cross bond closers are used and the second brick of alternate stretching courses is a header. In Dutch bond three-quarter bats (or purpose-mades) are used instead of closers, the first

stretching course beginning with a three-quarter, followed by a single header and the second stretching course beginning with a three-quarter, followed by stretchers. This bond was used by Professor H. S. Goodhart-Rendel at St. Wilfrid's Church, Brighton.*

Flemish Garden Wall, or Sussex bond (Fig. 3), gives a pleasant vertical pattern of headers, particularly where these are flared. The body of the walling consists of three stretchers and a header, except near the quoins where alternate courses have two stretchers. An interesting variant of this, which apparently has no name, has been used by Messrs. Sir John Burnet, Tait and Lorne at the Royal Masonic Hospital. It has also been used by Dudok at Hilversum Town Hall (Fig. 4). It consists of two stretchers and a header alternating, the headers being placed above the joints between the two stretchers of the course below. Though the bricks used in the Royal Masonic Hospital are uniform in colour the vertical lines of headers tell perceptibly in the large areas of walling. Purpose-made bricks are used without closers at the quoins. This bond should not be confused with Monk (or Monk's) bond (Fig. 5), although this also consists of two stretchers and a header alternating; the difference lies in the headers being not superimposed. Also, the Masonic Hospital bond has vertical emphasis, whereas Monk bond is dominantly horizontal. Monk bond is extensively used in Germany, sometimes with exaggerated emphasis of the horizontal joints.

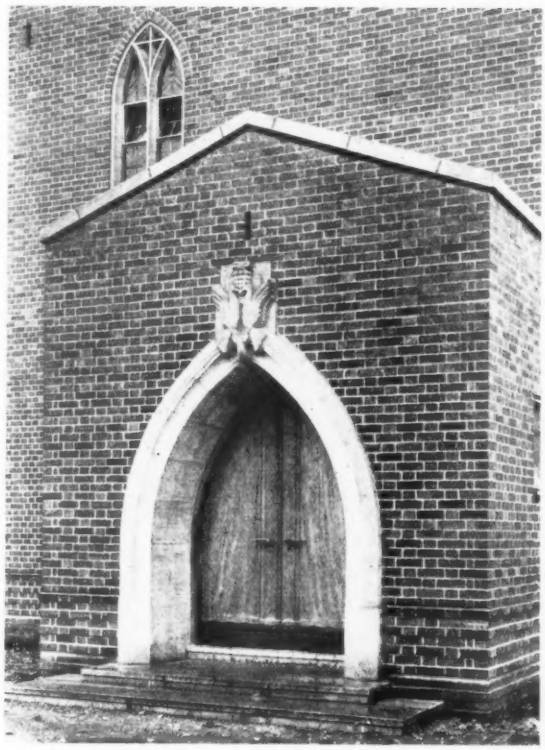
Two other bonds similar in construction but giving different effects are Facing bond (Fig. 6) and English Garden Wall bond (Fig. 7). In both, the construction consists of three courses of stretchers and one of headers, but in the former the stretchers break joint with only a quarter brick lap, whereas in the latter the stretchers have a half brick lap; the weak effect of the quarter brick lap is very pronounced. But in walls wholly of stretching bond, as in cavity wall construction, the vertical lines given by quarter brick lap can look effective, provided the perpends are accurately kept.

It is not necessary to do more than refer here to the many diaper patterns that are possible. A great number of them are illustrated by Nathaniel Lloyd both in drawings and photographs. Again it may be emphasised that the principal design function of diaper patterns is to give large scale effects. A recent English example is in the Duchy of Cornwall flats at Kennington by Mr. Louis de Soissons.

Purpose-made Bricks and Brick Carving

Again it is not possible in an article to deal extensively with such special branches of brick design as gauged brickwork, carved brickwork or the multitudinous uses of purpose-mades; moreover, the large subject of terra-cotta and faience demands separate treatment although it is allied to brickwork. Two recent examples of brick carving may be mentioned as indicating a revival of an ancient craft. At the Shakespeare Theatre Mr. Eric Kennington carved five figures in a brick specially made to match the other facings but carefully ground and burnt to give uniform colour and texture throughout. This building affords a great deal of material for those

*R.I.B.A. Journal, 13 January 1934.



The church of St. Thomas, Hanwell. Architect: Edward Maufe, M.A. [F]. Silver-grey bricks banded with light buff

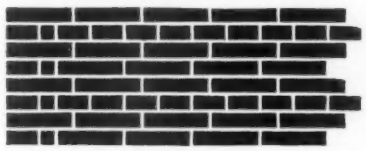


Fig. 6.—Facing bond

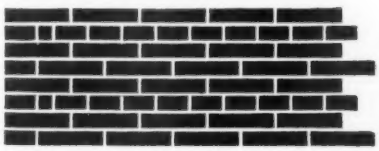


Fig. 7.—English Garden Wall bond

The Shakespeare Theatre. An example of the use of brick for interior facing. The bricks are light grey in the general wall surface and dark grey in the projecting bands, quoins and at the step lines

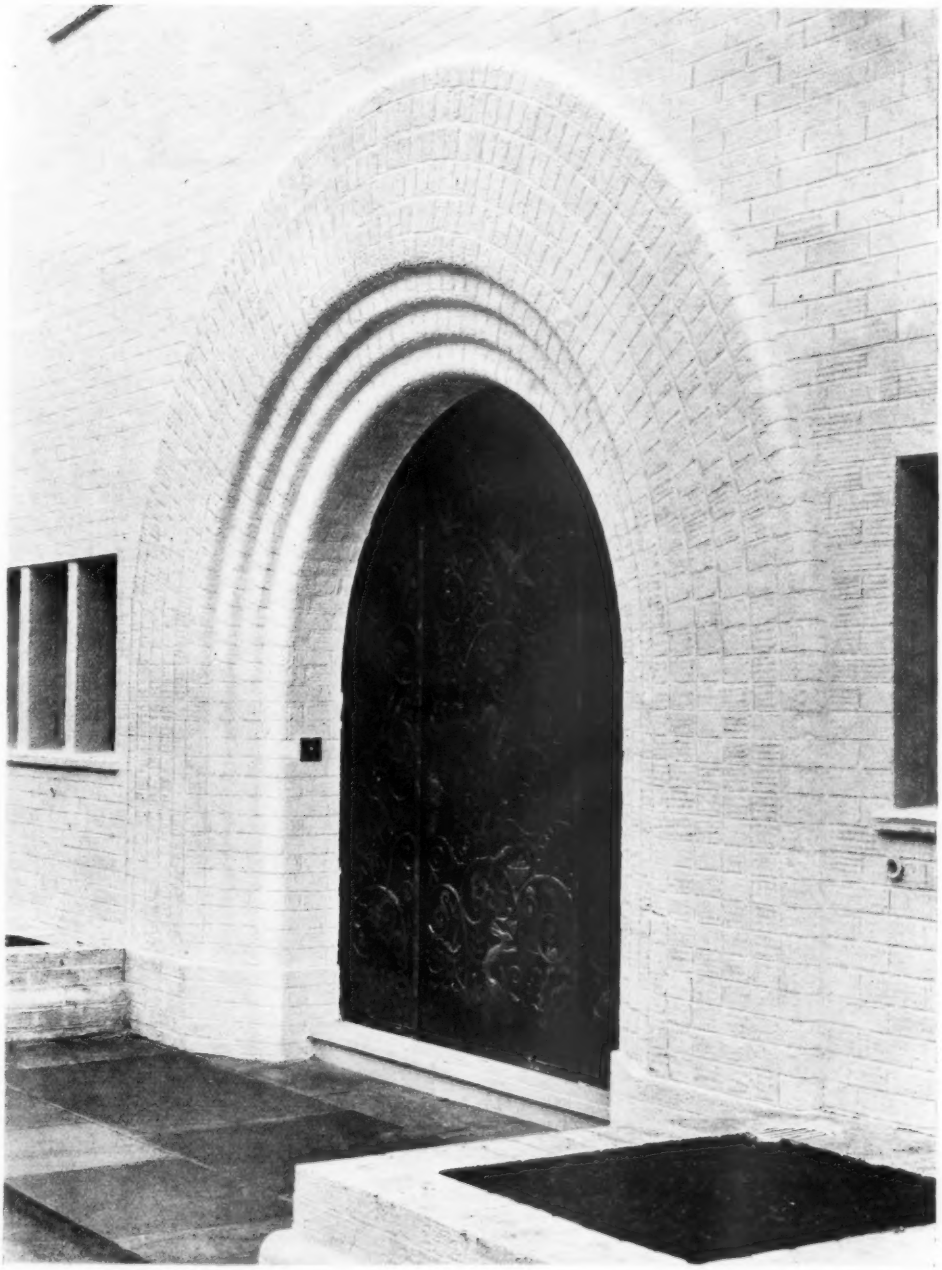
interested in brick technique. The other example is a carving by Mr. Eric Gill in sand-lime bricks at the Royal Society Mond Laboratory, Cambridge. Here the shallow undercutting is possibly more suited to a brick technique than is Mr. Kennington's at Stratford-on-Avon. A good example of the modelled effects possible with the use of purpose-made bricks is the tower of the Merchant Taylors' School at Sandy Lodge.

Jointing

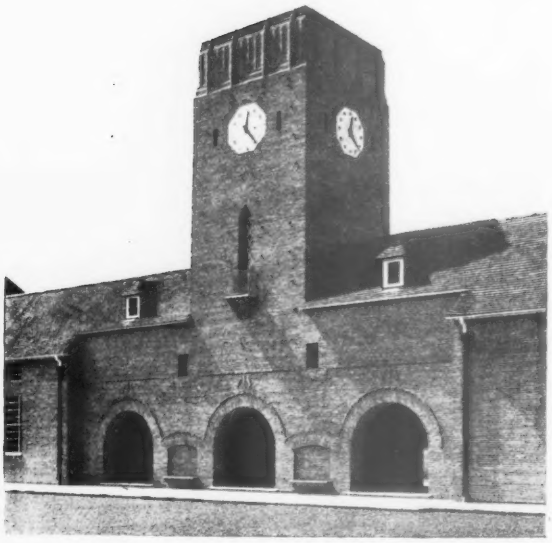
Reference has already been made to the influence of jointing on the effect of brickwork and the desirability of experimenting in each case. Available methods of finishing joints are numerous and each has merits. Smooth jointing is more suited to the mechanical-looking bricks such as pressed, glazed or sand-lime: indeed, regularly-shaped and evenly-coloured bricks seem to demand a smooth, narrow joint. Only the more extreme members of "the bill-hook party" will not be ready to admit that good decorative effects can be obtained with these bricks. The back walls and terrace of the new R.I.B.A. building, for example, afford a good example of what can be done with sand-lime bricks and suitable pointing.*

Perhaps the most common sin of the untutored builder in finishing brickwork is to give a smooth joint to a rough brick. Every brick-built town or village will supply warning examples of this. Generally speaking, the rougher the brick, the rougher should be the texture of the mortar surface, though the latter can always be a

* Normal size of joint, pointed in cement mortar of one part white cement and two parts white sand, finished flush with brick face and lightly trowelled.



"Broadlands," Ascot. Architects: Minoprio & Spencely [AA.]. The illustration shows the uses of a rustic faced brick, whitewashed, and of purpose-made bricks. The contrast between the arch in headers and the stretching bond of the walls should be noted



The Merchant Taylors' School, Sandy Lodge. Architects: W. G. Newton & Partners [FF.]. The modelling on the tower is obtained by the use of purpose-made bricks

little smoother than the former. The "struck" joint obtained by striking off extruded mortar with the *edge* of the trowel is nowadays common practice and with most bricks is successful. In the "wiped" joint, the extruded mortar is pressed back and slightly over the arrises of the brick with the *flat* of the trowel. Both need a skilful bricklayer to be fully effective and uniform. Wiping the finished joint with a piece of wood gives a pleasantly rough joint, though the roughness depends on the sharpness of the sand or "fatness" of the mortar. Wiping with a rag or brush gives a rougher finish. These methods (piece of wood, rag or brush) are suited to flush or recessed joints. Raised joints are best made by wiping extruded mortar with an inward curved piece of metal or wood.

The colour of jointing is more difficult to decide. Very rarely should it be darker than the brick; the common use of ash mortar in many industrial towns gives a black joint that ruins the appearance of good bricks, unless they are themselves very dark. An extreme case in masonry may be seen on the outskirts of Bath where many speculative villas have been built (and are being built) of rubbed Bath stone ashlar jointed with ash mortar. The effect is peculiarly hideous. The cold grey colour given by strong cement mortars is almost as offensive, particularly with warm-toned bricks.

Pointing may be coloured either by the selection of a suitable sand (varying from white to deep red according to the iron content) or by the admixture of colouring matter. With this last it is most necessary to make sure that proportions are carefully adhered to, or the wall will look unpleasantly patchy.

A wide joint is not necessarily a virtue. The thinner bricks (2½ inches and less) seem more suited to wide joints than the larger sizes, unless these are very rough (e.g., stocks). Much of the charm of ancient Roman brickwork can be attributed to the use of wide joints with an exceptionally narrow and rough brick. An extreme to the contrary is the full 3 inch glazed brick, which calls for a fine, buttered joint.

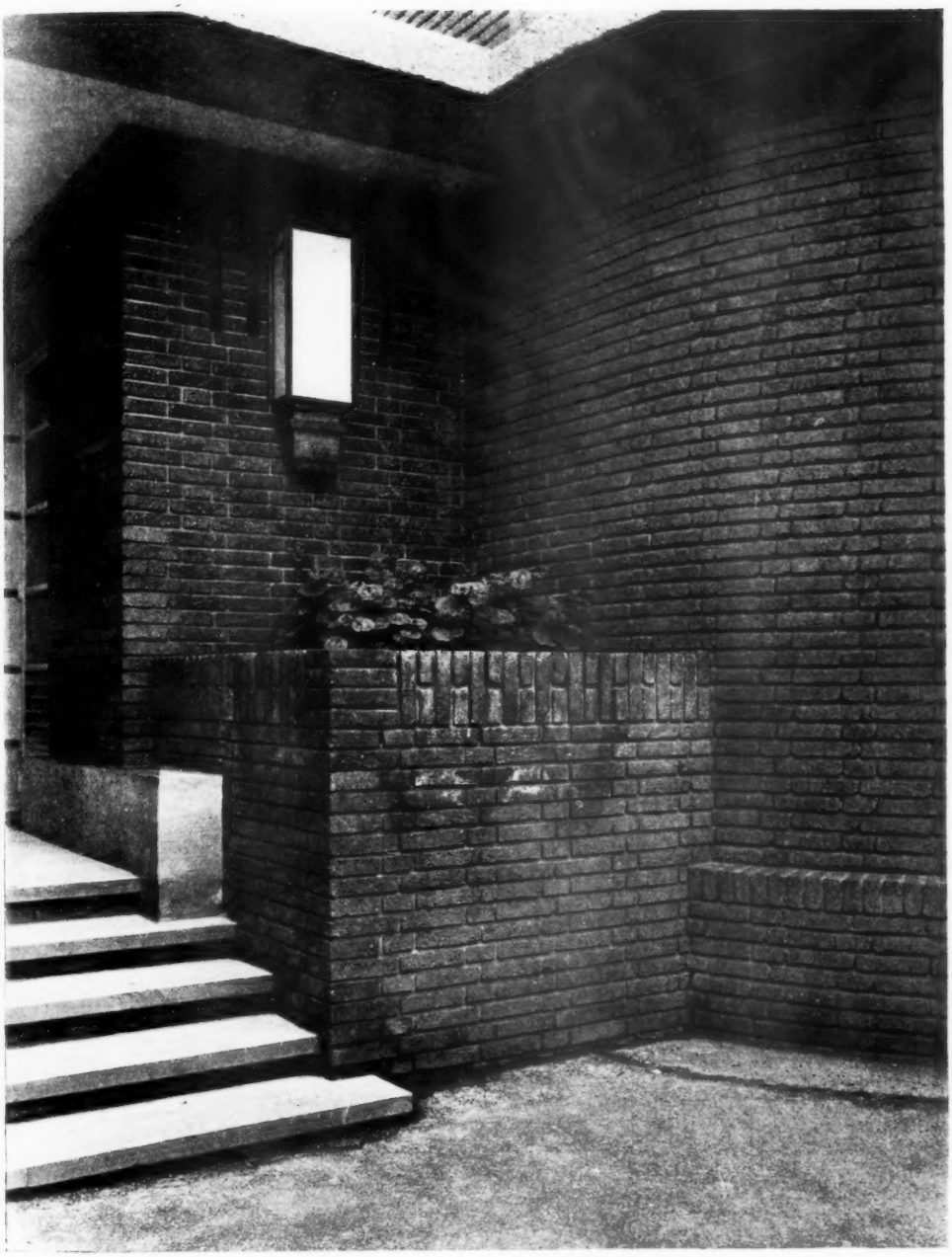
A point in architectural technique that demands attention is the practice of emphasising either the vertical or the horizontal joints. This is not uncommon in Germany and there are isolated cases in this country. Usually it is the horizontal joints that are emphasised in order to accentuate the "horizontalismus" of the building concerned. This can be done with normal rectangular bricks but usually rebated bricks (or sometimes with splayed ends) are used. Rebated bricks have not hitherto been obtainable in this country except by special order.

PART II
BRICK AS A MATERIAL

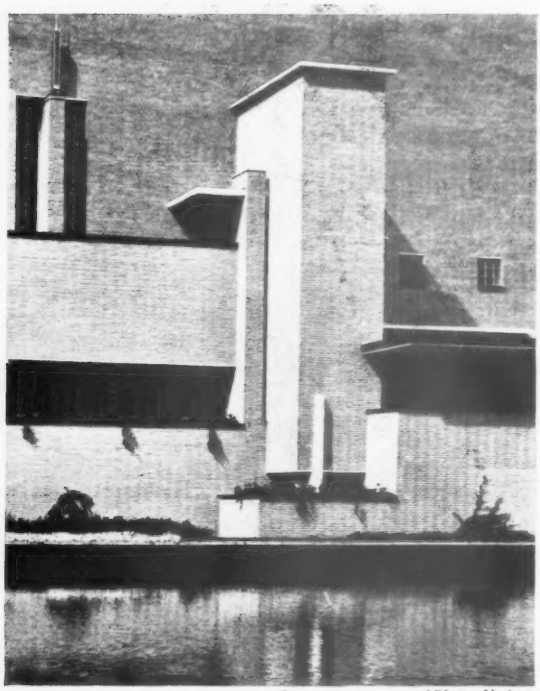
Manufacture and Types

The types of brick now marketed in this country are so numerous that classification is difficult. They may be classified according to their names, their intended uses,

"Dreamland," Margate. Architects: Iles and Leathart & Granger [A. & FF.]. Broad scale textural effects achieved by projecting courses and a rustic-faced brick



The Royal Masonic Hospital, Ravenscourt Park. Messrs. Sir John Burnet, Tait & Lorne [FF.] Very interesting brickwork showing many unusual points. The bond of two stretchers and a header gives a vertical pattern of headers; the bricks are an even red with light spots, set with a deeply raked joint; the quoins show the use of purpose-mades instead of closers; three to one hydrated lime mortar was used



[Photo: Yerbury

Hilversum Town Hall. Architect: Dudok. The walls are faced with 1½ inch yellow, rough textured, glazed bricks, relieved with some black, blue and gold bricks. The joints are raked out about ¾ inch

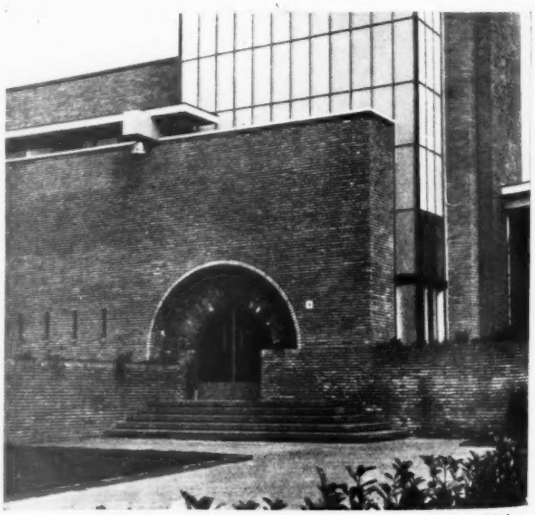
their method of manufacture or their properties. It is not possible in an article to do more than refer to a few salient points. Readers who wish to have a full, recent and authoritative account of modern bricks, and brick-making are referred to Building Research Special Report No. 20. Economic and Manufacturing Aspects of the Building Brick Industries. Reference to this valuable report has been made earlier in this article.

Scientific methods have latterly gained much ground in an industry that, until recent years, depended largely on chance and rule-of-thumb experiment. It would perhaps be more correct to say that science is discovering *why* certain constituents or methods operate, though their effects may long have been known. This has resulted in a higher degree of uniformity in the product, since predetermined qualities or colours can be obtained with more certainty. This is not only true of the blending of constituents but also of drying and firing. Improvements in kiln design and accurate pyrometric control have done much to reduce the percentage of unsaleable bricks, or what is more important for the architect, of bricks of doubtful quality. Generally speaking, Continental and American manufacturers are a little in advance of English in this respect. This may be due to the use of gas or oil firing which gives greater controllability than does hand-stoking with solid fuel; attempts at mechanical stoking with solid fuel do not as yet appear to be very successful.

The most outstanding development in firing is the growing use of the tunnel kiln. In the continuous type kiln (Hoffman and others) the kilns are stationary and the fire travels. In the tunnel kiln the fire is stationary and the bricks travel through it. Some authorities say that the tunnel kiln does not give the degree of vitrification, and therefore durability of the brick, that is given by the continuous kiln, but it is claimed that with one type of kiln this difficulty has been overcome.

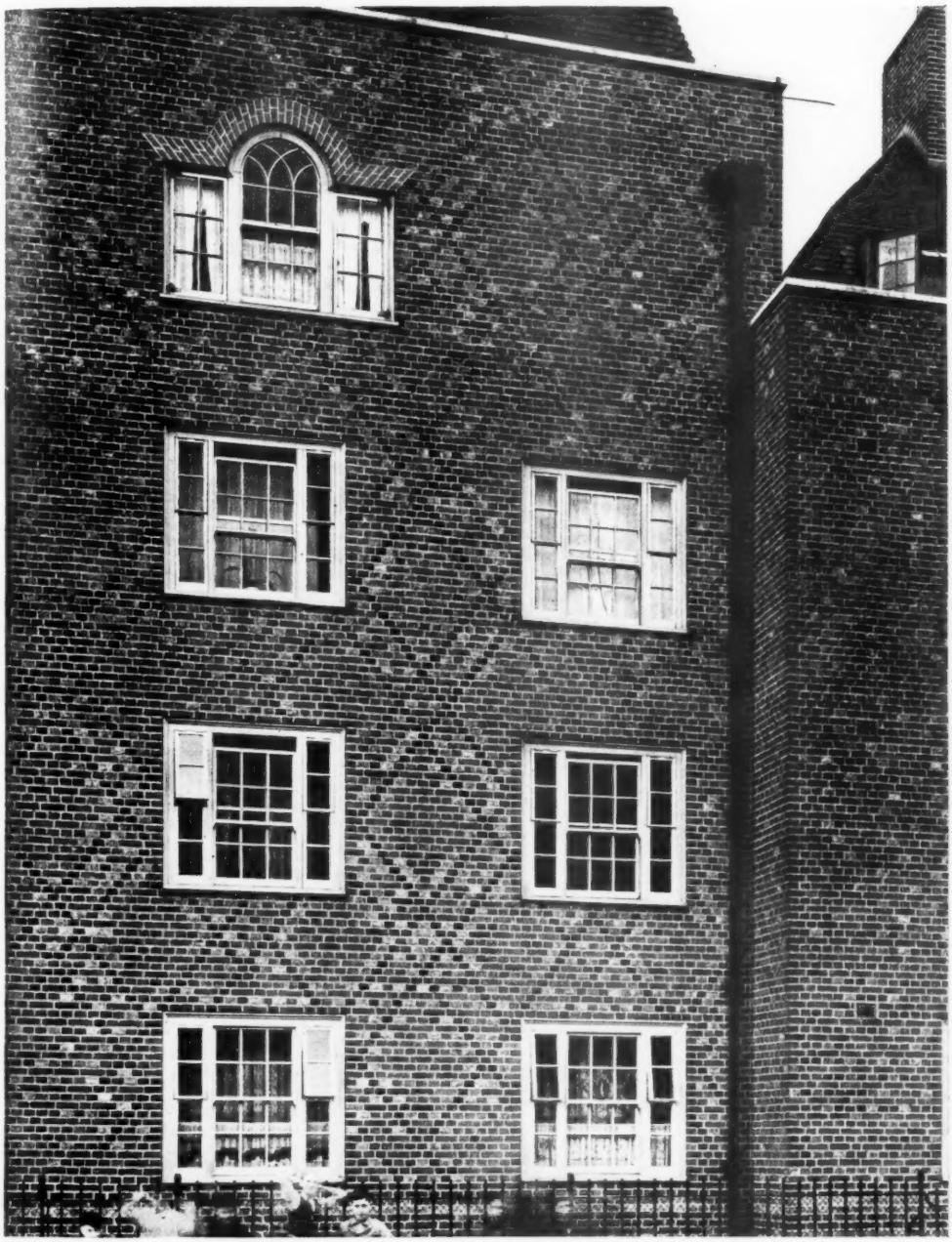
Two practices in the preparation of the raw material call for comment. These are the use of "grog" and fireclay. Grog is usually burnt clay which is ground and added to the raw clay batches. Its use enables a considerable amount of control to be exercised over the porosity of the bricks. Its effect is somewhat similar to that of mixing sand in the material, but is free from the risk of the brick cracking on cooling.

The practice of blending fireclays with brick material greatly extends the range of colours possible in facing bricks. It is done extensively by American manufacturers. Some firebrick manufacturers, particularly American, are now making common bricks and their products are almost invariably very good. Where a bed of fireclay is too narrow to allow it to be profitably worked for its own value the utilisation of the adjacent inferior material for making bricks may make it so. Shale from coal workings is also sometimes used in the same way. The bricks from these deep level clays have grown in use and popularity in recent years. They are produced at a price low enough to attract London buyers, although the nearest places

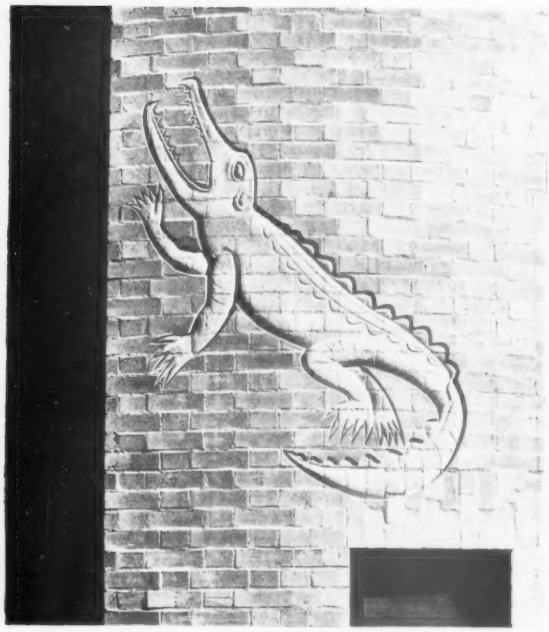


[Photo: Yerbury

A school at Hilversum by Dudok. The arch is in vermilion glazed bricks



Flats for the Duchy of Cornwall, Kennington. Louis de Soissons, O.B.E. [F.]. A modern use of diaper formed of diagonal bands of plum-coloured headers, flanked by bands of grey headers, the panels being filled with red bricks in English bond. The mortar for pointing was 4 parts sand, 1 hydrated lime and 1 part white cement; joints wire-brushed and slightly recessed



The Royal Society Mond Laboratory, Cambridge. Architect: H. C. Hughes, M.A. [F.]. An example of low relief carving by Mr. Eric Gill in sand-lime bricks

of manufacture are in the Midlands. The facing bricks used on Battersea Power Station are from this source.

It is worth noting that some manufacturers of stocks are now firing by kiln; in one case we understand that a tunnel kiln is used. Kiln burning results in a brick of more regular shape.

Architects should realise that although the term "engineering brick" is usually taken to mean a Blue Stafford, there are several red or brown wirecuts of great strength which are not less suitable for taking heavy loads or usable as pavings.

Perforated bricks are extensively used on the Continent. Several advantages are claimed for them, and it is a little surprising that they have not been made in larger numbers in England. In this connection mention should be made of the cellular Fletton, though the intention behind it is different. While this brick at present is not permitted to form "a solid wall" under the building regulations of some local authorities, it has shown under test a surprisingly high resistance to crushing compared with the ordinary Fletton. Where weight reduction is important, as in filling to a steel-framed structure, the advantages of a light-weight brick are obvious.

The sand-lime brick*, although it dates back to before 1866, has only in recent years been manufactured in large quantities in England. The bricks are made of sand (about 90 per cent.) and slaked lime which are mixed, the material being then passed to the presses and the bricks formed. They are then stacked on a truck and placed in an autoclave where they are subjected to steam pressure for about seven hours. On removal from the autoclave they are ready for use.

The usual colour is a dull white, varying to yellow or grey according to the sand. They are also obtainable in various shades of red, brown or dark grey according to the colouring pigment added in manufacture. The reputation of the sand-lime brick has suffered somewhat from some early examples of very poor manufacture, but the "snags" in the manufacturing process appear to have been now overcome and they are being extensively used. They are being used principally as a common brick for interior work in some parts of the country; in others, notably the London area, they are being used as a cheap substitute for glazed bricks, though their light reflecting qualities are not so good or so permanent. (See under "Light Reflection" later.) They are also being used, fair face, as interior wall linings in industrial buildings and schools; their smooth texture, even shape and light colour make them suitable for this. Paint can be satisfactorily applied to them when they have dried out.

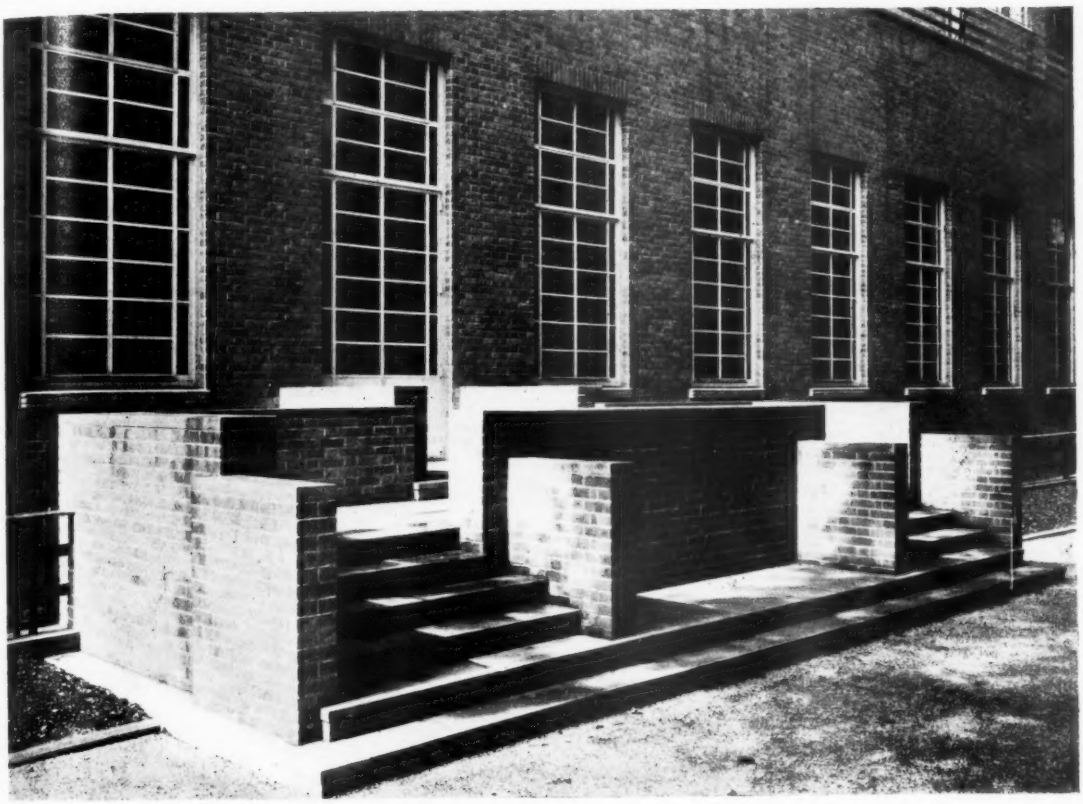
Experimental work is at present proceeding on the production of a shale-lime brick,† and some are being manufactured. It has been found that shale from waste dumps has pozzolanic properties which make it suitable, when ground, for incorporation with lime to make a shale-lime brick. The process is of interest because it may make possible the production of bricks in areas deficient in brick earths, such as Scotland. Bricks made by two processes have been tested at the Building Research Station and show satisfactory strengths. Work is still proceeding on the weathering qualities. It seems possible that these experiments may result in the production of at least a usable common brick.

Mortars

Most, though not all brickwork troubles, can be attributed to the mortars. As in the case of plastering, the breaking down of the old localised traditions, particularly of lime manufacture and use, has resulted both in operatives having to use materials with which they are unfamiliar and employing known methods with unsuitable materials. At the present time very many different kinds of lime are produced and distributed over wide areas. There is as yet no standard specification and no organised instruction on methods of use. It is true to say that the question of making and using building lime is to-day chaotic. Therefore in talking of "lime-mortar" one is generalising dangerously since there is little guarantee that any two limes will give identical results. It is good news that the Building Research Station are making serious efforts to evolve a reasonable order in this matter.

* See Building Research Special Report No. 21. Sand-Lime Bricks.

† Annual Report of the Building Research Board, 1932.



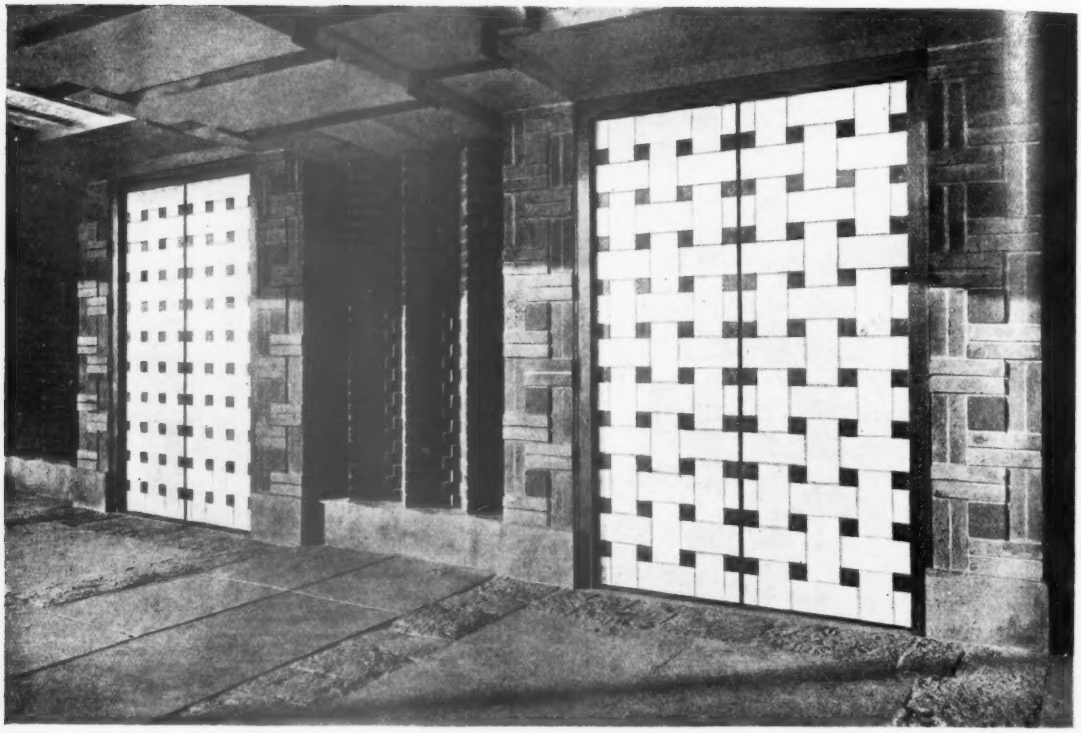
Nurses' Home. The Children's Hospital, London. Architects: Stanley Hall & Easton & Robertson [FF.] An example of the growth in popularity of pale toned bricks. The building is faced with light brownish-grey Stamford bricks pointed in 3 to 1 cement mortar, a yellow sand being used. The makers of these bricks have supplied the author with a Building Research Station report on the bricks

It is therefore small wonder that architects attempt to play for safety by specifying Portland cement mortars. Portland cement is a uniform product made to a standard specification and its qualities are known; also it makes for rapid building. Moreover, building surveyors encourage its use partly for the same reason and partly because it "gives strength," a factor with which they are mainly concerned.

Nevertheless its use is liable to bring a train of special troubles from which lime mortar is free. For example, it has been found that walls in cement mortar are more liable to admit rain-water than those in lime mortar.* Moisture enters not so much by reason of the permeability of the bricks or the mortar as by minute cracks which form on account of shrinkage or the failure of the mortar to adhere closely to the brick. Owing to the fact that cement mortar shrinks more than lime mortar and that the mix of cement mortar is normally "shorter" or less "buttery" these minute cracks are formed.

Because a wall built in a strong cement mortar is a rigid, inelastic structure, the danger of cracking is greatly increased. With a lime-mortared wall thermal and moisture movements are taken up in the wall itself. Many of the cracks which occur in new buildings are often loosely attributed to "settlement," whereas they may be the direct result of building brickwork in cement mortar. The materials of all new buildings inevitably shrink on drying; the use of cement mortar helps to make the effects cumulative. Shrinkage cracks should not, however, be confused with the cracking primarily caused by the expansion of long lengths or large areas of concrete, although the rigid resistance of a cement-mortared wall may do much to aggravate the trouble from this source.

* B.R.S. Questions and Answers No. 11, New Series.



The Shakespeare Theatre. Patterned brickwork in silver-grey bricks at the main entrance

An interesting case in which repointing with cement mortar actually destroyed brickwork that had been standing for 900 years is worth quoting.* The building concerned was the tower of a cathedral, built of Roman bricks. About sixty or seventy years ago a restorer of the fabric repointed the tower with a Portland cement mortar. A recent inspection revealed that deep erosion was taking place on the faces of individual bricks, while the faces of others were crumbling and powdering badly. The Building Research Station remarked that the failure might be due to the action of soluble salts present in the bricks or the mortar, or to frost, or to a combination of these. The controlling factor was the outlet for moisture. If the solutions could find an outlet through the mortar they would cause efflorescence (or freeze) on the surface of the joint. With a mortar denser than the brick they pass out through the latter, and if the brick were susceptible to this action, the face of the brick would suffer. The moral of this story appears to be that mortar should be less dense than the brick, because pointing, when it perishes, can be renewed, whereas decayed brickwork is not only unsightly but may be prohibitively costly to replace. These lean mixes are, however, usually so "short" as to be unworkable. This leads to the practice of adding lime to make the mortar more "buttery." It is soon found, however, that experiments in proportioning end by evolving a lime motar gauged with cement.

In a recent case the Building Research Station commended the substitution of lime for some of the cement in a mortar.† It was decided to use a dry hydrate of greystone lime, moderately gauged with Portland cement in order to impart a reasonably rapid set to the mortar. The proportion of cement was between 10 and 15 per cent. by volume of the lime; these were mixed and sieved in a dry state. The solution of the problem of reasonably rapid building, while avoiding difficulties that may follow from the use of cement, appears to lie in these cement-lime mortars. Pending the issue of a standard specification, a guarantee of soundness for the lime may be

* B.R.S. Questions and Answers No. 26, New Series.

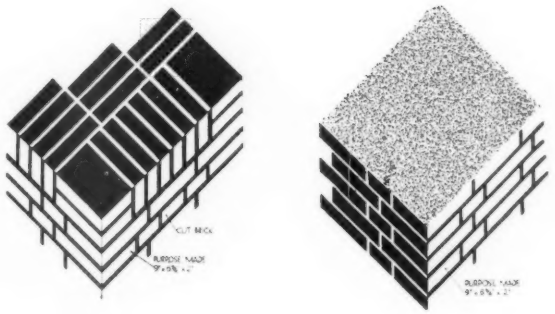
† B.R.S. Questions and Answers No. 8, Second Series.

obtained from some makers. Architects should note that the Building Research Station are prepared to give opinions and advice on proposed mortar specifications in specific cases.

EFFLORESCENCE

Efflorescence cannot be prevented so long as there are soluble salts in the bricks or mortar. While many brick manufacturers are taking steps to improve their products in this respect, risk of their presence in sand remains. Moreover Portland cement contains a proportion of these salts and is therefore more likely to cause efflorescence than lime mortar. Again the use of a mortar less dense than the bricks will assist in causing an efflorescence that may be inevitable to appear on the joints (where it will be less unsightly) instead of on the bricks.* The recommended treatment for efflorescence when it occurs is to wash it off with water, continuing the process until all the salts have been deposited.

* See B.R.S. Questions and Answers Nos. 3 and 12, Old Series.



The Royal Masonic Hospital, Ravenscourt Park. On the right is a drawing showing the use of purpose-mades to avoid closers, with a bond of one header and two stretchers. On the left is part of a breast wall at the side of a door, showing design with the special quoin bricks and brick on edge

The Curzon Cinema, London. Architects: Sir John Burnet, Tait & Lorne [FF.]. Yorkshire sand-faced bricks, light red in main walling, black in base and area wall. Built in lime mortar with a flush joint, rubbed with a wooden tool.

In this connection special attention should be paid to parapet walls and similarly exposed portions of brickwork which are likely to absorb and evaporate water repeatedly. In many buildings parapets show efflorescence when the remainder of the walling is free from it. It is desirable to carry asphalte or flashings up to the copings at the back and to see that the copings themselves will exclude moisture. Where porous or jointed materials such as brick on edge and stone or concrete slabs are used as copings it is desirable to place a damp course immediately below.

Sound Insulation

One of the principal functions of a partition is to prevent transference of sound from one room to another. While it will be agreed that the ideal partition material does not exist, or more exactly, that none has outstanding advantages in all cases over the others, the 4½ inch brick wall is deservedly favoured. It is worth noting that one county architect who builds numerous schools, after trying a great number of alternatives, has returned to the use of the 4½ inch brick wall as a partition between classrooms. The following table of sound reductions for different partition structures, published by the Building Research Station,* will be of interest because it is concerned solely with air-borne sounds and therefore has particular reference to such rooms as classrooms and offices.

The Bulletin contains the results of tests on one hundred and seven partition structures, divided into sound frequencies below 300, between 300 and 1,200 and above 1,200 cycles per second. The frequency range 300 to 1,200 covers the majority of noises generated in buildings; the most penetrating noises being those with frequencies from 300 to 500 cycles. For the purposes of this article a few typical examples have been selected to demonstrate the sound reducing qualities of the brick wall; the 300-1,200 frequency range only has been given.

Partition Structures.	Average Sound Reduction in Decibels at Frequencies 300 to 1,200 cycles per second.
1. 4½ inch Fletton wall in cement mortar (unplastered)	50
2. Ditto, in lime mortar (unplastered)	51
3. 4½ inch Fletton wall in cement mortar, one side rendered	53
4. 4½ inch cellular Flettons (unplastered)	49
5. Reinforced concrete 4 inches thick (unplastered)	44
6. 3 inch hollow clay blocks (unplastered) weighing 16 lb. per sq. ft.	35
7. 4 inch terra cotta hollow block weighing 27·6 lb. per sq. ft. (unplastered)	47
8. Two layers of 2 inch Thatchboard with eelgrass quilt in the interspace (unplastered)	58
9. 4 inch by 2 inch wood studding at 16 inch centres, wood lathed and finished with three coats lime plaster both sides	51
10. Ditto, but with gypsum plaster	43

* Building Research Bulletin No. 14. The Reduction of Noise in Buildings. Recommendations to Architects.

It should be specially noted that the foregoing table is concerned with air-borne sounds only and has no particular reference to structure-borne sounds such as are generated by machinery fixed to the structure. The dominant factor is mass; generally speaking the heavier the partition the more effective it is (compare 1 with 8). It may also be noted that plastering improves efficiency.

In addition to percolation through interstices of structures sound is also transmitted in a building by "diaphragm action" in which a whole partition or floor) acts as a drum, that is to say, it actually bends or vibrates. "This diaphragm action . . . is by far the most important factor causing noise transmission in modern buildings."†

Therefore the more taut or rigid is the partition structure the more liable it is to transmit sound. Moreover, sounds of low pitch (such as traffic rumbles) more easily excite diaphragm action. It can be said that a wall built in cement mortar is more likely to transmit noise in this way than if built in lime mortar because the cement-mortared wall is the more rigid construction. Further, a homogeneous wall will *conduct* sound about a building more readily than one of units (*i.e.*, bricks) that have cushioning joints of a comparatively soft mortar between them. Therefore, again a lime-mortared wall is preferable to one in cement mortar.

Heat Insulation

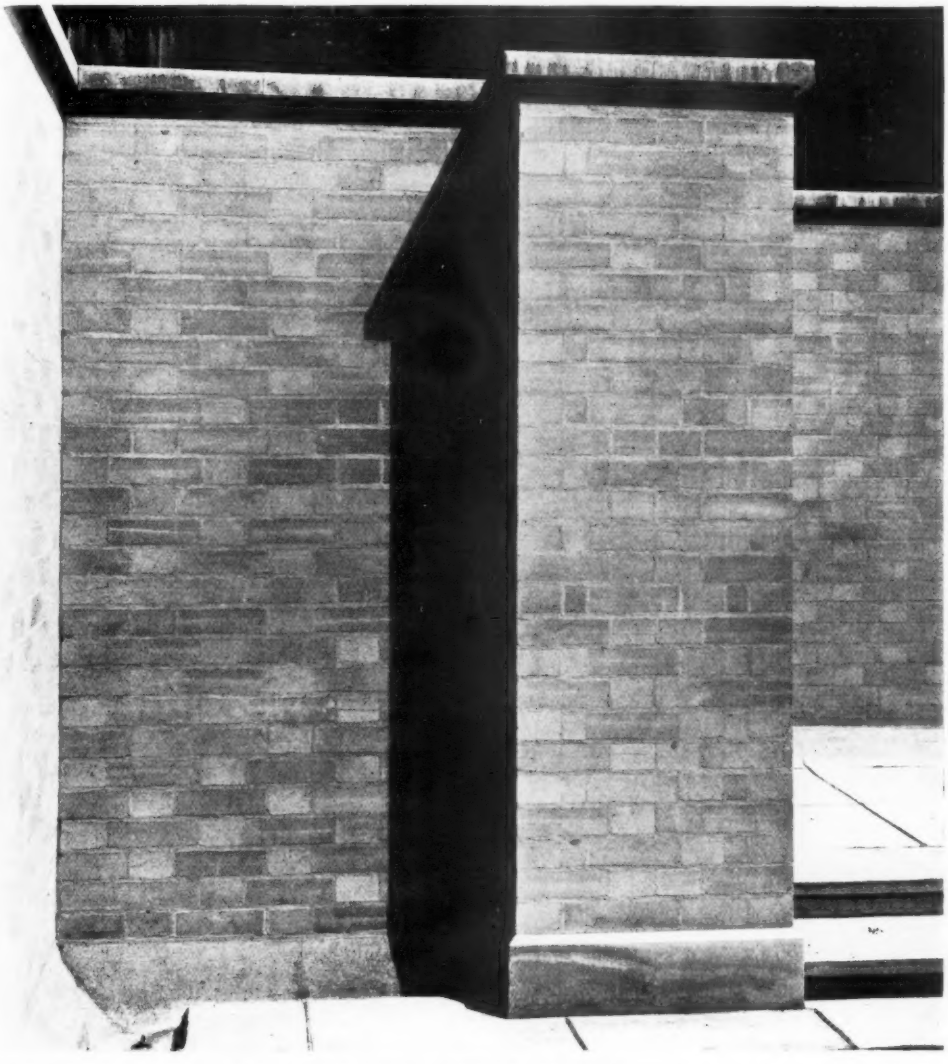
Values that will be of use in building practice for the thermal conductivities of typical wall structures are not easy to obtain. Where the exclusion of solar heat is in question much depends on the colour of the external wall surface and to some extent on the colour and nature of the internal room surface. On the question of heat loss outwards through walls comparative figures are available; but the relative wetness of the wall very much affects efficiency, so that laboratory experiments are not necessarily a true guide, except for comparing the materials and structures under identical conditions.

In the following table‡ the comparative figures are of heat transmitted in B.Th.U. per square foot per hour for 1 degree Fahr. difference of temperature between the wall faces. In short, the lower the figure the more efficient the wall as a heat insulator.

Wall Construction	Figure Representing Heat Transmitted
1. 9 inch wall of London stocks in cement mortar	0·68
2. 9 inch wall of Flettons in cement mortar	0·70
3. 9 inch wall of sand-lime bricks in cement mortar	1·03
4. 11 inch hollow wall of sand-lime bricks and galvanised iron ties	0·72
5. 6 inch wall of 12 inch by 9 inch by 6 inch terra cotta blocks	0·82
6. 6 inch wall of 3 inch outer slab of gravel concrete and 3 inch inner slab of breeze with bitumen sheeting between	1·33

† B.R.S. Bulletin No. 14.

‡ Building Research Technical Paper No. 6. Thermal Conductivities of Walls, Concretes and Plasters.



The New R.I.B.A. Building. Architect: G. Grey Wornum [F.]. Sand-lime brick as used on the back elevations and terrace The bricks are pointed in one part white cement and two parts sand, trowelled finish

7. 6 inch wall of 2 inch gravel concrete outer slab, 1½ inch cork slab and 2 inch breeze inner slab plastered on face	0·31
8. 6 inch timber frame construction of ¾ inch weather-boarding, 1 inch rough boarding, 4 inch by 2 inch studding and lath and plaster	0·40

The difference between the 9 inch solid and 11 inch hollow wall in the same bricks will be noticed (3 and 4), but the efficiency of the latter is not so great, as might be expected, specially when compared with the remarkable low figure for typical wooden house construction (8). The effect of cork insulation on a reinforced concrete structure (6 and 7) is also worthy of note.

The effect of dampness on the thermal conductivity of a wall is well demonstrated in an experiment* made by

* B.R.S. Technical Paper No. 6, p. 15.

the Building Research Station. A 9 inch wall of stocks in cement mortar was fixed in the apparatus when thoroughly wet. The heat transmission figure was found to be 1·80, decreasing as the wall dried out to 0·71 at 10 days, the normal figure (0·68) being reached at the end of a fortnight. Therefore a porous wall surface normally exposed to the weather, such as an 11 inch brick hollow wall or 14 inch solid wall, may at times be a poor heat insulator, unless it is given a waterproof skin such as paint or a really waterproof stucco. But in practice few stuccoes can be regarded as waterproof in the sense that an oil-bound paint is waterproof, unless they are applied under carefully controlled conditions. Moisture is admitted to the wall through cracks and crazing, soaks into the wall structure and is prevented by the stucco from evaporating. The crazing may be so minute as to be invisible when the stucco is dry but will none the less admit moisture, especially under wind pressure. The amount of moisture thus admitted may be insufficient to damage plaster or decoration, but enough to lower appreciably the thermal resistance of the wall. In his full-scale experiments at the Bauhaus, at Dessau, Dr. Gropius found that concrete walls of light porous aggregates covered with stucco, which in theory were good heat insulators, in practice often gave poor results owing to their having a relatively high, and permanent, moisture content. While these porous aggregates absorb water very readily, similar conditions will be found with most common bricks customarily used under stucco.

On the question of making the facing-brick wall waterproof it can be said that nothing has as yet proved superior in badly exposed positions to ordinary cavity wall construction. Generally speaking, a temporary reduction of thermal resistance due to a rain-soaked outer skin is of much less importance than preventing moisture from reaching the inner surface of the wall.

Light Reflection

The light reflecting qualities of bricks are of importance particularly in their use for facing light wells or in closely built-up areas. The following table* gives values for clean brickwork. The "diffuse reflection co-efficient" is expressed as the ratio of the amount of reflected radiation to the amount of incident radiation.

Material	Diffuse Reflection Co-efficient
1. Sand-lime brick (fine textured white)	0·60
2. " " (coarse textured white)	0·49
3. White glazed brick	0·75
4. Gault brick (cream)	0·64
5. London stock brick	0·38
6. Fletton (light portion)	0·57
7. " (dark portion)	0·37
8. Leicester Red	0·41
9. Luton Grey	0·22
10. Staffordshire blue	0·11

It should be realised that these values will be considerably altered according to the length of exposure to normal town atmospheres. The importance of periodic washing of the walls of light wells was emphasised in a recent paper by the chief engineer of the General Electric Company.† The company find that the cost of washing the light wells twice a year is more than offset by the saving of lighting in the adjacent offices. In considering the above table the fact that glazed bricks, when washed, return to their full light reflecting power, whereas other bricks do not, will be of some moment.

Some Comparative Costs

The following particulars of comparative costs have been specially prepared for this article by Mr. H. J. Venning, F.S.I. [*A*]. London prices and normal conditions with straight 14 inch walling have been taken as a basis. The table will be found to contain much material for thought on the subject of using bricks.

Fletton Brickwork in Lime mortar with Flettons at 56s. d d.	£25 17s. 6d.	Rod reduced.
Ditto in Stocks at 85s. d d.	£33 0s. 0d.	
Fair face and struck joints	1d.	foot sup.
Extra over Fletton brickwork for facing bricks at £5 per m. and weather joint or other pointing	5½d.	" "
Note. Add for each additional 10s. on the cost of facing bricks, say	¾d.	" "
Extra over Flettons for stock facings and pointing	4½d.	" "
Extra over Flettons for Rustic Fletton facings and pointing	3d.	" "
Extra over Flettons for Sand Lime facings and pointing	5d.	" "
Extra over Flettons for 1st quality White Glazed facings and pointing	3s. 3d.	" "
Portland Stone ashlar, average 6¾ inches on bed	7s. 6d. to 8s. 6d.	" "
Cavity walls—two half bricks, inner skin Flettons 56s. m., outer skin facings £5 m. and pointing flush	1s. 10d.	" "
Ditto, all last but outer skin Stocks limewhited	1s. 10d.	" "
Ditto, two half bricks, both Flettons and two coat rendering externally, the finishing coat being white cement	2s. 0d.	" "
One brick wall in Flettons and white cement rendering as last	1s. 9d.	" "

* B.R.S. Special Report No. 21.

† Floodlighting. By Thomas E. Ritchie. Reviewed in the R.I.B.A. Journal 23 December 1933, pp. 189 and 190.

FIG. 1.—ST. LUKE, STIRIS. Eleventh Century

"Of that Byzantine empire the universal verdict of history is that it constitutes, without a single exception, the most thoroughly base and despicable form that civilisation has yet assumed. . . . There has been no other enduring civilisation so absolutely destitute of all the forms and elements of greatness, and none to which the epithet of MEAN may be so emphatically applied."—*History of European Morals*, 1869. (Lecky.)

"Thus from the middle of the fourth to that of the sixteenth century the æsthetic tradition, germinated in Constantinople, . . . was a creative force of which the products stand to-day as landmarks in the cultural history of the world. Civilisation is conceived mainly in great cities. As the great city of the Middle Ages, Constantinople stands unchallenged."—*The Byzantine Achievement*. (R. Byron.)

BYZANTINE WALL BRICK IN GREECE
Part I

HUGH CASSON, B.A.

INTRODUCTION

This essay is in no sense a research into a new subject, nor does it embody the discovery of a new principle of design, nor even a new archæological theory. It is the collection of some notes and drawings made while in Greece, travelling with a grant from the Craven fund, during the winter 1932-33, and covers only a small part of the study of Byzantine art and architecture. The title limits the study to wall-bricks, as the brick dome and vault construction form so large and intricate a feature of Byzantine architecture as to need separate investigation.

As I was only in Greece for three months, and these not the best for travelling, my surveys of churches and monuments were of necessity brief, but I managed to visit all but two of those mentioned in the last chapter, and certainly gained a great enthusiasm for what Horace Walpole called "the disgusting subject of Constantinopolitan history." A rapid succession of treatises on various aspects of Byzantine art and architecture has, in recent years, gone far to remedy the injustice of centuries. Unfortunately, many of these works are written in Russian, Bulgarian, Serbian and Modern Greek, and the general reader is, therefore, deprived of such writers as Uspensky, Zlatarsky, Orlandos, Lampakis, Sotiriou and Andreades. He can, however, depend on such French and English scholars as Millet, Choisy and Diehl, and Dalton, Schultz Weir, and Byron.

One of the greatest difficulties in the study of Byzantine architecture is the dispersion of the monuments. Winter, with its accompanying mud and snow, redoubles the hardships of the traveller, and helps still further to distort a sense of proportion already warped. For a really active bug, an exceptionally back-breaking drive can change only too easily an entire appreciative perspective. Travelling conditions are, however, improving with great rapidity and the courteous hospitality of the peasant is renowned. Finally, there is the unique and stereoscopic quality of the Greek light, which gathers mountains, sea and sky into a unity surely attained in no other country. "Those who sit at home with their anthologies, their Homers and Byrons, have long grown impatient of the hackneyed eulogy. Travellers, on the other hand, know that the poet has not lived who can hackney the Greek scenery itself."

CHAPTER I
HISTORICAL NOTE

"The dogs bark, but the caravan passes"

"Le mot Byzantin," says Bayet, "qu'il s'agit de peinture ou de politique, éveillait aussitôt des idées fâcheuses." From the acrimonious tangle, woven by scholars and historians to the furtherance of their private hypotheses, it is no easy task to disentangle the thread of architectural development. From the dogmatic hysteria and moral prejudice of Lecky, to the magnificent perversity of Robert Byron, the battle has been waged by scholars from every country. It would, therefore, not be irrelevant to gather together such evidence as has emerged from the controversy.

The beginnings of Byzantine architecture have never been satisfactorily accounted for. The researches of Vagüe, Butler and Kondakov in Syria, of Strzygowski, Rott, Miss Bell, Preusser, Herzfield and Guyer in Asia have provided abundant data, and there is little doubt now that the cities of Alexandria, Antioch and Ephesus—the triple constellation of Strzygowski—were the centre of influence. The great art movement of the fourth and fifth centuries spread over Egypt, Syria, Mesopotamia, Asia Minor and Iran.

In Greece, Perso-Sassanian influences link with classical traditions on a basis of Hellenism. Every country plays an influential part. From Mesopotamia comes the vaulted basilica: from Persia the squinch dome, the preliminary to the pendentive: from Armenia the central dome plan, and perhaps the triple apse end. This last suggestion of Strzygowski's is improbable. Alighting with little ungainly pounces on every point as he makes it, he goes on to say that the great architects of the Early Christian era, Zenobius, Anthemius, Isidore and Manuel of Armenia—recorded names are lamentably few—created nothing not ultimately derived from the Iranian domed building on a square plan, and that Haghia Sophia is a "purely Armenian building" (Unsprung). From the Greek-Iranian origin, through the pre-Christian Semitic influences to the point where Hellenism succumbs, we can, I think, assume a permanent oriental predominance, but the spade still has much to do in Asia Minor, and it is unwise to dogmatise.

The position of Constantinople in the fourth and fifth centuries was humble compared with that of Hellenistic cities. But though she had created nothing she was the clearing house for the centralisation and diffusion of the many influences at work. Though sterile herself, she had a strong classical tradition, and it was within her walls that the heavy mass-group styles of Armenia, Anatobia and Mesopotamia, with their austere silhouettes, and close stone-cutting, gave way to the picturesque impressionism of the ninth century Byzantine work, which makes full use of ornament and the play of light, shade and colour. Her rôle has been too often minimised, and plenty of oriental motifs came not from obscure monasteries of forgotten Syria, but from this city, which, says Villehardouin "de toutes les autres était souveraine." She received, welcomed and propagated, and with diversity of technique combined identity of purpose.

In Greece the chronology was, roughly, as follows. In the sixth century there was a Slav invasion, but churches continued to be built. In the tenth century Arabs and Saracens arrived, bringing with them the Cufic script. From 1025-50 the Bulgars were in Greece, and in 1261 the Greeks returned to Constantinople.

Greece received nothing from Constantinople before the fourteenth century. The predominating influence was Oriental, with a slight Hellenistic element from Salonika. There are no actual Armenian imitations, but at Mistra the traces of style are definitely un-Hellenistic. The earliest existing monuments are ninth century. To the eleventh and twelfth centuries belong the churches of Athens, Daphni and Phocis. Later examples are found at Mistra and Ochrida.

In Bulgaria there is a strong Oriental influence to be traced at Pridop and Sophia in the early centuries. The Greek cross plan was introduced in the thirteenth century, but only used on a small scale, the interiors being greatly enriched. Monuments exist at Tirnovo (St. Demetrius) and Mesemvria (St. John).

Macedonia has little before the thirteenth and fourteenth centuries, but there are several interesting churches at Prilep and Boiana (1259).

The thirteenth century was reached before the full strength of Byzantine influence reached Serbia, where it had scarcely a century of opportunity before the Turkish invasion. The monuments are found at Studenitza (1314), Gratchanitza (1320), Lesnovo (1340) and Zicha (1210).

* * * *

Early ornament, whether from Islam, Altai-Iran, or Mesopotamia, was almost entirely linear in character. To the essential elements surviving from Hellenistic times were added Eastern motifs, the vine, acanthus, meander, and fret patterns, rendered with a technique combining Greek and Syro-Mesopotamian features. Zoomorphic forms and foliated designs are elaborated after the eighth century with the addition of monsters from Mesopotamia. Flat bands, plaited forms and restless interlacing designs cover the walls. There is a complete denaturalisation of sculptural design, giving way to conventions and unreal elements.

NOTE ON ILLUSTRATIONS

It has only been possible to include a few of the 40 photographs, and over 60 sketches and measured drawings with which the original essay was illustrated, but all these can be seen in the Library.

The author wishes it stated that he is indebted to Mr. Hubert Megaw for many of the photographs.—ED.

This pre-Hellenistic manner of geometrical repeat patterns originated probably in the use of diverse materials, and produced its effect by slant-cut surfaces and colour, and not by plastic representation of natural forms. The human figure was never admitted, not even to give scale, (cf. *Form in Gothic*, by Wilhelm Worringer). These patterns came through Persian influence, and were practical because they had significance, without any second or literary purpose alien to the principles of art for its own sake—they were "permeated with symbolism, but their practical aim was to lighten the exterior mass of the building, and achieved this by the use of light and colour from the basis of line and ornamental surface." The patterns were designed to be seen at a distance, and consisted of forms created by religious emotion, and moulded by the churches into stereotypes. The only ornament of objective meaning was the band of Cufic lettering described in a later chapter. This, originating from the old Semitic country, was receiving decorative transformation in the East, and found its way in the tenth century to Athens.

* * * *

Bricks were certainly used in Lower Egypt, Lower Nubia, Mesopotamia, Persia and the Balkans as far West as Novgorod. There are exceptions. O. M. Dalton mentions the brick palace at Quer Ibu, Mardan, which was erected by stone builders from Constantinople. All brick was burned brick, except in Iran and Mesopotamia, where the natural material was unburned brick, and owing to its perishable nature no monuments survive. From Antioch and Ephesus the art of brick building passed to Rome, and was adopted by Greece, despite antique tradition and an abundance of good building stone.

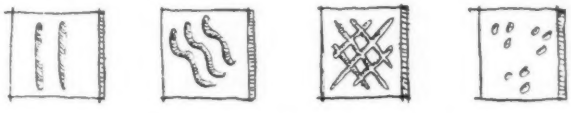
CHAPTER II

THE BRICK

That material and workmanship are the prime factors in the development of art is an obvious truth: it is an equally obvious truth that building material is directly dependent on local geographical conditions. The use of brick by Byzantine builders was, as McMullen says, primarily constructional, but at the same time was developed by them in the frankest and fullest manner. It was introduced from Mesopotamia and Egypt through Imperial Rome, and was popular for several reasons. It made an even joint between polygonal or uneven masonry: it was an easy material for arch and dome construction: finally it offered wide scope for decorative workmanship. McMullen divides Byzantine bricks into two classes, depending on their use: when performing some actual constructional function they are "bricks," and become "tiles" when applied as covering, useful or decorative. However, for the purposes of this essay the term "brick" will be used throughout.

Forms of bricks varied infinitely. The most frequent form was the Roman "plinthos," made of tempered clay, pressed into moulds by the feet of workmen. They were generally marked with a stamp indicating their destination. For instance, those destined for ecclesiastical use had crosses and monograms: in Haghia Sophia they have entire inscriptions. Stamping was probably introduced from Assyria and Babylonia and was certainly a commonplace in Rome. The bricks of a porch at Ostia are stamped "De Olearia," indicating the presence of an oil market. Ciampini, in his book *De Ædificus a Constantino Magno Constructis*, gives representations of many signs and stamps copied from those of ancient churches in Rome. Examples at Salonika have similar symbols of a religious character. The name of the maker is, however, rarely found. A primitive "frog" was given to the brick by sweeping finger marks made while the clay was wet.

At the ruined monastery of Daou, Attica, the bricks pavingthe floor all have this "frog" (see figure) in various designs, and one has a peculiar marking like the print of a dog's pad.



For cornices moulds were used. Column shafts up to 12 inch diameter were built up of two semi-circular bricks. For larger shafts segmental, purpose-made bricks were used.

FIG. 2.—HAGIA MONI, NAUPLIA

W. L. George notices a gradual change in texture as wall as size. Earlier bricks are rough, with foreign elements, pebbles and stone-chips, introduced. Also their colour is greyish-brown, rather than red, and they are very hard burnt. Later bricks become smoother, redder, end softer burnt, and the late Turkish brick is of much the same texture as the modern "rubber." These changes are noticeable both at Constantinople and Salonika. "Anonymous" records the use of light Rhodian bricks in the dome of Haghia Sophia, but Lethaby and Swainson could find no trace of these, though in the pendentives a whitish light substance was used in irregular quantities.

Modern colour washing, and the difficulty of access to the higher parts of a building, make exhaustive researches into the question of brick sizes almost impossible. I have thought it best to tabulate the sizes measured by architects, with additions by myself, under the heading of the buildings in which they were noted.

Building.	Size.
Theodosian Walls	14″ × 2″
Haghia Sophia	14½″ × 2″
Dome	27″ × 9″ × 2″
Palace of Porphyrogenitos	14½″ × 1¾″
St. Eirene—normal	14″ × 1¾″
repair	12″ × 1¾″
Turkish	11″ × 1″
House in Constantinople	12″ × 1½″
House in Constantinople, eighteenth century	11″ × ⅞″
Note the gradual diminution in size.	
St. Luke of Stiris (Fig. 1)	14″ × 1½″
St. Luke of Stiris (small church)	14″ × 1¼″
Kaissariani (window)	7½″ × ¾″
Mistra	
Pantanassa	1½″ bricks, 2″ joints
Metropole (Fig. 4)*	
St. George, Salonika	18″ × 1″
Akrocorinth (cistern)	1½″
St. Sophia, Monemvasia	1⅛″
Omorphi, Athens	1½″–2¼″
Daou, Attica	14″ × 1⅜″
Churches of Nubia	5″ × 2½″ × 1¼″
Eski Djouna Salonika	
normal	16″ × 12″ × 2″
repair	15″ × 13½″ × 1½″
Turkish	10″ × 10″ × 1″
St. John Studios, Constantinople*	14″ × 14″ × 1½″
Bogdan Serai, Constantinople	2″
Holy Apostles, Athens (Fig. 5)	1″–9″
Kaprikarea	1′ 4½″ × 1″
St. Theodore	1′ 4½″ × 1⅛″

Average joint thickness 1″–2½″.

CHAPTER III
MORTAR

Byzantine mortar was so well made that it remains to-day as hard as in the best Roman buildings; in fact, at Mistra, a dome still stands with two pendentives gone. The lime was well chosen, and the sand clean, being always river sand. At Salonika, Athos, and in the Meander Valley, marble lime was used. The formula was of Roman origin, and varied little; the proportions being roughly ⅓ lime, ⅓ sand, and ⅓ crushed tile or Keramotos. M. Kouppos is probably correct in adding hair to the formula. In hydraulic works the sand was omitted. Variations include an Arab mortar called "Khorasan," consisting of hydraulic lime slaked to powder, cotton shreds, and olive oil. Walter George compares it to Portland cenent in consistency. It is also noticed by Strzygowski and Andreossy (*Die Byzantinische Wasserbehalter*). The lime was slaked for years at a time and then mixed with the crushed tile, which had to pass through a 0.4 mesh; in stonework, gravel and stone-chips were included. When marble was too expensive, a cheaper lime was used of light hydraulic qualities. Pozzolana was preferred if obtainable.

A glance at the table of brick and joint sizes given above will show the lavishness with which the Byzantines used their mortar. The joint is seldom less than brick thickness, and is usually thicker by an average proportion of 5 to 4. It has been calculated that a wall at Blachernes is two-thirds mortar. This is not, as Choisy suggests, to counteract settlement. It is, in fact, this profusion of mortar which explains why scarcely a plumb wall exists in Constantinople to-day. There can be little doubt that economy was the main reason for such building technique, for bricks were always well baked, and, therefore, costly.

By way of a sidelight it is interesting to note that Codinus mentions that the mortar for Haghia Sophia was mixed with barley-water; and further, that the bricks were so light that they floated. M. Texier, in all seriousness, has disproved this theory, assisted, no doubt, by the Dervish who apparently was his constant companion.

CHAPTER IV
BUILDING TECHNIQUE

Evidence points to the fact that the earliest Byzantine buildings were of rubble construction, very roughly coursed. The core of the wall was of concrete, laid by means of large wooden moulds, in which the facing

* An asterisk has been used throughout the essay to indicate that the MSS. copy in the R.I.B.A. Library contains photographs and/or drawings in addition to those referred to in the text in illustration of the building or detail so marked.

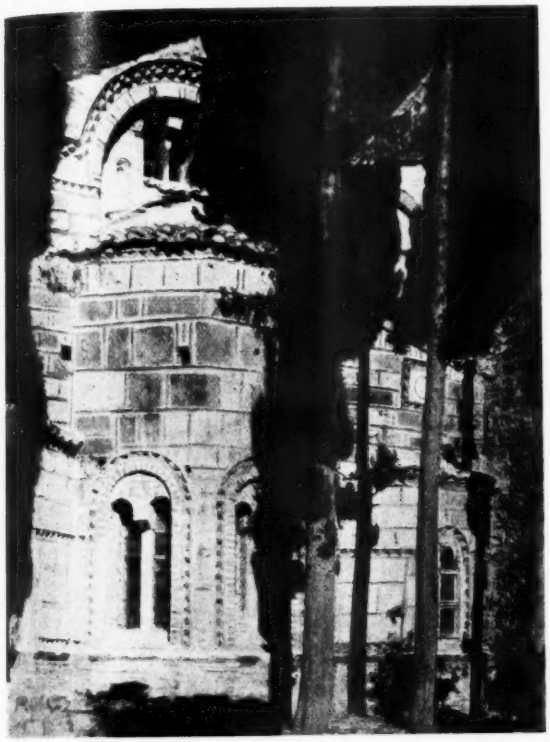
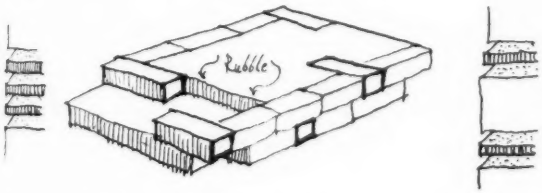


FIG. 4.—METROPOLE, MISTRA. 1310 A.D.

stones were adjusted. The cement was then thrown in and pressed down with a rammer. When the cement had set, the plank sides were removed, leaving holes which can still be observed in many walls. Lateral cohesion was obtained by means of continuous wooden ties, built into the wall every five or six vertical feet. A rough bond was used, and the joints slightly raked.



A strong horizontal effect was obtained by zones of four or five brick courses at regular vertical intervals. These numbered never less than three in Constantinople, and were of two types.

As illustration of this technique, the following measurements are given. Between each course of stone the joints are thinner, as the mortar has been squeezed out by the weight above it.

BRICK ZONES

Courses and Joints.	Total Depth.	Average Brick.	Average Joint.
5 courses and 5 joints	2′ 2½″	1⅞″	3⅛″
5 ,, ,, 5 ,,	2′ 2″	1⅞″	3″
5 ,, ,, 5 ,,	1′ 9″	1⅞″	2½″
8 ,, ,, 8 ,,	3′ 3″	1⅞″	3″
6 ,, ,, 6 ,,	2′ 3″	2″	2½″

Stone courses between brick zones vary from four to ten in number (cf. drawings of Paspatis and photographs by Ebersolt). In the older churches brick zones are less numerous. In Greece the stone courses gradually diminish in number, till eventually there is only one.

* * *

From this origin perhaps develops the *parement cloisonné i.e.*, each stone enclosed by bricks. Millet, treading an unwavering, and, therefore, strictly limited path to the climax of his theory, cites Ochrida as an example; for there are found both brick zones and *parement cloisonné*. It is certainly purely a Greek technique, as in Macedonia, Serbia, Athos, Constantinople, Asia Minor, the Caucasus, and Russia the brick zones remain up to four courses in thickness. The few Greek excep-

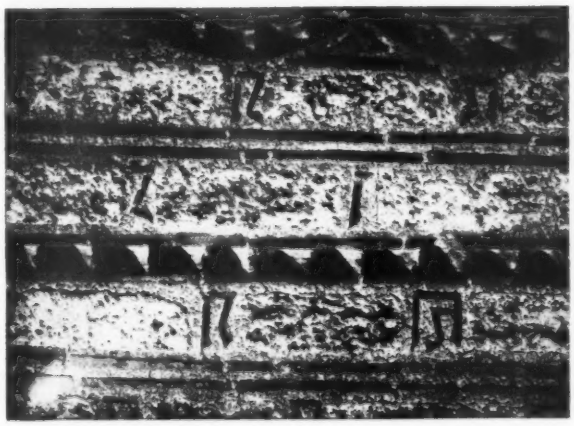


FIG. 5.—THE HOLY APOSTLES, ATHENS. Eleventh Century

tions to the single course rule are to be found at St. Luke of Phocis, St. Sophia Monemvasia, and the churches of the Western Mani described byRobert Traquhair. For examples of one course work see Figs. 7, 13, 16, 18, 22, and *Frontispiece*. For examples of two or more courses see Fig. 13.

Professor Sotiriou (Lech. Eph. 1929, pp. 213-214), suggests that *parement cloissoné*, arose indirectly from the distinct stone-cutting tradition which survived in Greece from ancient times; *i.e.*, that the mason "squared up" irregular or polygonal blocks with brick fragments.

Mr. Hubert Megaw, now at work on the church of Holy Apostles, Athens, has propounded the most lucid theory of this development in technique, and the results of his investigations are shortly, I believe, to be published in the Journal of the British School at Athens. The various stages of development he suggests are as follows:

FIG. 6.—EVANGUELISTRA, MISTRA. c. 1300

FIG. 7.—HOLY APOSTLES, SALONICA. 1315 A.D.

1. Uncoursed rubble.
2. Coursed rubble.
3. Horizontal brick courses for emphasis.
4. Brick fragments between unsquared stones.
5. Stone becomes squared; brick fragments remain.

This is, I think, a very probable scheme of development. It should be noted that nowhere does *parement cloisonné* occur below plinth level.

* * *

The Byzantine joint was undoubtedly heavy and severe, but no attempt was made to narrow it down, and thus lighten the effect. At Ochrida and Lesnovo (thirteenth and fourteenth centuries) the thickness can only be described as archaic. At Kazandjilar a "fillet" or "tuck" joint is found, and in the eleventh century at Nauplia, Greece tries a raked joint. In the fourteenth century at Mistra the old thick joint reappears, to be replaced in the fifteenth century by the "asses back" —a joint which had been in use in the tenth century at Arta. By this time, however, the fashion for stucco had arrived, and appears at Mistra, and Rudenica in Serbia: and finally brick patterns are painted on the stucco surface, and the art of decorative brickwork was dead.

CHAPTER V
DECORATIVE USE OF BRICKWORK

There are two decorative brick motifs used by the Byzantines, which, if only on account of their ubiquity, require special notice. They are (1) the "skew dentil" or *scie de dent*, and (2) "the Cufic letter."

(1) Of this, the most common of all decorative motifs, the origin seems to be unknown, though possibly derived from Syria in the sixth century. It is, however, in that class of ornament, which has no other source than its innate obviousness as a decorative scheme. It is found in two main forms: as a frieze or band, and as a cornice—the latter in Constantinople and the North, the former

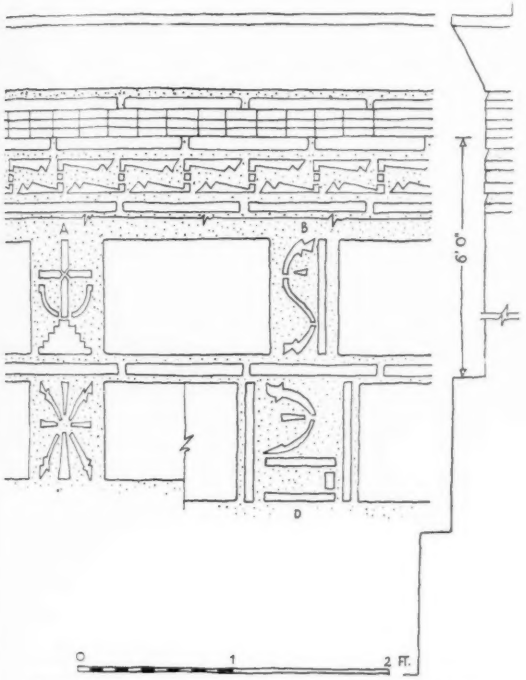


Fig. 9.—Chonica, Apse Brickwork detail below Cill

almost exclusively in Greece. In the sixth century it is found, as a cornice, in Constantinople, Salonika and Ravenna. Its first appearance, as a band, in Greece is at Skripou (ninth century),* where it encircles the entire building at plinth level, and also the windows. Millet, in postponing its arrival till the tenth century, has apparently overlooked this example.

By the eleventh century it is in universal use: at the eaves: encircling windows: in friezes*: in conjunction with marble cills and cornices. The marble cornice is still used at the end of the twelfth century at Nauplia, but St. Luke of Phocis is the last important Greek monu-

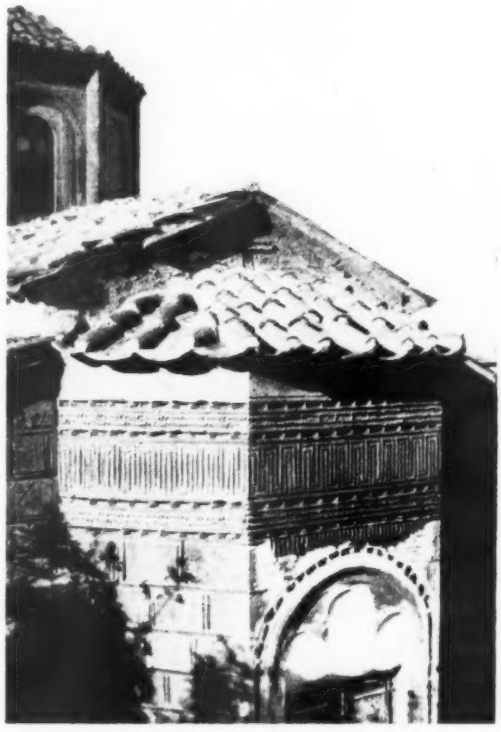


Fig. 10.—Hagia Moni, Nauplia

ment to make great use of it. The "skew dentil" is rarely found in Serbia, nor is it common in Salonika. Russia, on the other hand, provides several examples. By the end

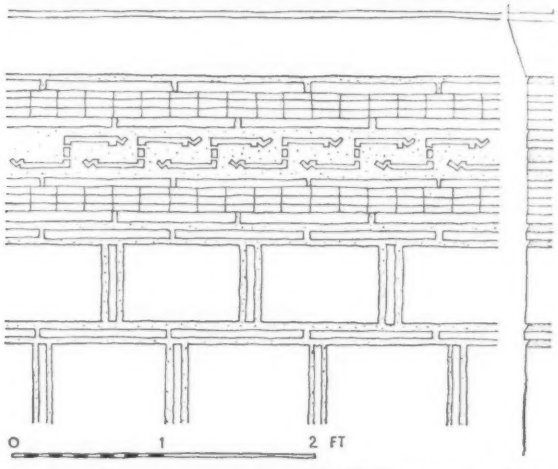


Fig. 11.—Hagia Moni. Detail of Apse Brickwork below Cill

of the thirteenth century, Couchaud estimates, the "skew dentil" band has left Greece, and remains, only in cornice form, at Constantinople. Nearly all the photographs and drawings show the "skew dentil" in various positions.

(2) The term "Cufic" is derived from the town Kufa, the capital, from 750 B.C. onwards, of the Abbasids, and situated on the banks of the Euphrates. This style of writing survived till the beginning of the twelfth century, and was then superseded by the curved Arabic characters, still used to-day in Turkey. In late years, however, there have been attempts to suppress it.

Millet derives its decorative use from the habit of filling the interstices in irregular masonry with brick fragments (*L'Ecole Grecque*, p. 254). The ornamental possibilities once realised, it was retained as a purely decorative motif. Similar brick ornament is found from Castoria to Calamata. Millet divides them into two classes:—

(*a*) Those readable as Greek characters, which may be interpreted as the initials and monograms of Christian symbolism.

(*b*) Direct borrowings from the cufic alphabet.

To the first group (*a*) belong such initials as K (Kurie), X (Christ), C (Σωτηρ), (-)ΙΙ(- (Theotoke), and Α—Ω.

Cufic ornament is employed in two main styles: either in the vertical joints of the stonework or else in a continuous frieze—the second presumably a development of the first. They are found together both in Athens on the Panaghia Lycodemon and St. Luke of Stiris. There are two techniques in the second style. (1) *Cut brick*. In this process the end of the brick is slant-cut to a pattern, placed in the wall, and the mortar brought flush up to the surface (cf. Fig. 5* and measured drawings in Figs. 9, 11 and 12. (2) *Champlevé*—whose name explains itself. It is a form of terra-cotta bas-relief, the surface of the pattern built flush with the masonry, and the background filled in with mortar.* The Catholicon of St. Luke seems to provide the earliest examples, less than ten in all. The champlevé at St. Theodore, Athens,* is arranged more or less haphazard, and almost certainly is not contemporary. The vogue for this form of decoration was very short-lived.

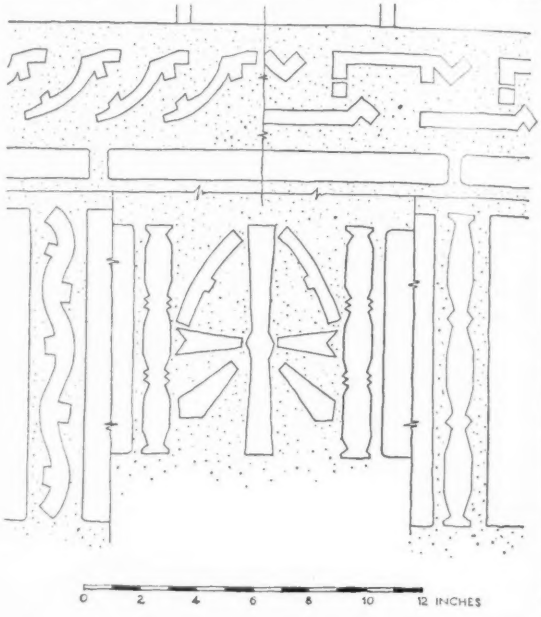


FIG 12—BRICK DETAILS, PANAGHIA EKKLESIA MERBAKA, ARGOS

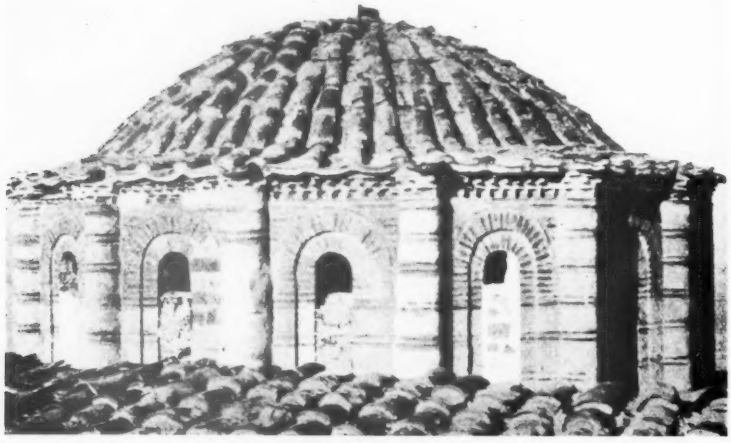


FIG. 13—S. SOPHIA, MONEMVASIA. 12th Century

(To be continued)

Vermin in Buildings and their Extermination

The following notes on the various kinds of vermin, principally insects, which infest buildings have been compiled in response to numerous demands for information on means of extermination. It has not been considered necessary to include notes on methods of destroying rats and mice as these are well known.

THE BED BUG

Description

The adult bed bug (*Cimex lectularius* Linn.) is a flat, oval, wingless creature with three pairs of legs. Its colour is chestnut or mahogany brown when it is unfed, but after feeding it is much darker in colour, elongated and swollen. Its mouthparts are adapted for piercing and sucking; *the bed bug can feed only on blood and lymph.* Besides human blood it will, under laboratory conditions, feed upon that of rats, mice, sparrows, pigeons, etc., and there is considerable likelihood that in houses where there are records of longevity without contact with human beings that one of these animals may have supplied the necessary food. The insect is usually nocturnal in its habits, feeding at night and returning at once to its hiding place where it spends the rest of its time. This hiding place is usually out of sight but sometimes in heavy infestations bugs will remain in the open and quite visible in the daytime. In this country a bug normally feeds about once a week and returns to its crack or crevice to digest its meal—in winter the intervals between meals are probably longer—and seldom excretes on the surface upon which it has been feeding, but waits until it gets back to, or near to, its harbourage. This habit is useful in one way as it sometimes helps to give a clue to the whereabouts of the insects even when they themselves are not seen. Another characteristic of the bug is its smell, which is curiously musty and quite unmistakable when once it has been recognised. A well-trained nose is an enormous asset when searching for bugs! A female bug will lay 100-200 eggs during her lifetime at a rate of three or four a day. They need not necessarily all be laid consecutively, and a bug which is starved for long periods, or is subject to other unfavourable conditions, may have three or four periods of laying. Eggs hatch in from one to three weeks, and it may be longer, but the average in summer is probably about eight to nine days. The young bed bug is like the adult in many respects, but it is more thick-set in build, lighter in colour at first, and, of course, is much smaller. It moults five times before becoming mature, getting darker in colour on each occasion. The time taken from egg to adult may be as short as six weeks, but this is very exceptional and an average in summer in this country is about ten weeks; adverse conditions of climate, lack of food, etc., may prolong the period to a year or more. The adult bed bug can live for six months without food and, when conditions are unfavourable, for four years or more in houses or even outside; under favourable conditions the life cycle is completed much more rapidly. They are exceedingly resistant to frost and to heat though 113° F. and above is said to be lethal to them; naturally, the higher the temperature above this point to which they are subjected the quicker death will ensue.

Common hiding places of the bed bug are: in mattresses and the crevices of beds; in the cracks in furniture, in upholstered furniture, more especially where the upholstery is attached to the frame; behind pictures and picture backings; on the underside of seats of chairs, etc.; in the fabric of the house—behind wallpaper, especially where pouched or overlapped against woodwork; behind picture rails, skirtings, architraves and mouldings, and pipes fitted against the wall; in floorboards; in cracks in plaster-work, nail holes, and in similar situations.

How Infestation Spreads

The bed bug can be distributed in many ways but probably the most usual source of infestation is the movement of furniture from bug-infested premises to another house without steps being taken to see that it is disinfected on the way. Another is the purchase of second-hand furniture after the original furniture has been cleansed. A certain amount of migration of the bug population takes place from time to time but nothing like the amount popular superstitution attributes to it. Given ample food supply and comfortable living accommodation, the bug does not migrate. The use of infested material from demolished houses, either as firewood or in other ways, is a potential source of danger. Whilst the bug is sometimes carried on clothing the amount of infestation from this source is very small.

The importance of providing as few hiding places as possible may well be noted here, particularly in new housing estates, which are very liable to become infested. Woodwork, particularly skirtings, architraves and picture rails, should be reduced to a minimum, and wallpaper is undesirable. Partitions which shrink and crack also afford hiding places and should, as far as possible, be avoided.

Is the Bed Bug Injurious to Health?

In the process of feeding the bed bug pierces the skin and injects saliva into the wound. When this has been done it sucks up a mixture of saliva and blood or lymph. Under experimental conditions it has been known to carry disease but has never been convicted of so doing under natural conditions. Individuals react differently

to the bites, but many suffer acutely during the summer from lack of sleep due to the irritation at night. In children it is often possible to pick out those coming from buggy houses by their pasty and drawn faces and listless appearance.

Remedial and Preventive Measures

There is only one certain method known at present of killing bed bugs *and their eggs*, and that is by the use of hydrocyanic acid gas. Unfortunately, this gas is extremely poisonous to man; it can therefore only be used by experts who have a thorough knowledge of the dangers involved and the precautions that must be taken if risks are to be avoided. The cost varies with the size of the house and the number to be treated. The approximate charge made by firms experienced in this work for treating four-roomed cottages built in a row would be, say, £6 for one house and £3 each for a large number of houses or thereabouts.

With the present technique of using hydrocyanic acid gas it is necessary to evacuate the treated house for 24 hours. If the house is one of a row, the house on each side must also be evacuated for about 7½ hours, that is, 6 hours while the house is under gas and 1½ hours while the gas is being dispersed; this necessitates the provision of alternative accommodation for the occupants of the house treated. Experiments are at present being conducted which may lead to improved technique and may reduce the period of danger to about eight hours, thus making the provision of alternative accommodation unnecessary. This would obviously be of importance where the number of houses to be treated is large. The burning of sulphur at the rate of 6 lb. to every 1,000 cubic feet of air-space has given satisfactory results in many instances, but it is probably effective in not more than 85 per cent. of houses treated. Two applications are necessary, the second about three weeks after the first, in order to kill any insects that hatch out after the first fumigation.

Many proprietary preparations for spraying are marketed, but much further research is necessary as to the relative toxicity of sprays to bed bugs before any authoritative statement can be made in regard to their efficacy. In the Report on bed bugs issued by the Ministry of Health two formulæ are mentioned, viz.:

(1) A solution used by H.M. Office of Works, consisting of:—

Paraffin oil	50 gallons
Orthodichlorbenzene ..	2 gallons
Methyl salicylate	1 gallon

(2) A mixture for spraying which has been successfully used in the Army:—

Paraffin oil (B.Pt. 170° C. to 240° C.) ..	1,000 parts
Oil of mirbane (nitrobenzene)	2 ,,
Cresol	2 ,,
Pyrethrum flowers (ground)	10 ,,

The pyrethrum is soaked in the liquid for 24 hours and the mixture then filtered clear.

A blowlamp is useful, *e.g.*, for the treatment of infested woodwork, and in some districts the woodwork of all demolished houses in certain slum clearance schemes is subjected to this treatment. If this is to be effective it must be done thoroughly; if a blowlamp has been applied only to parts of the woodwork people are liable to think that all the woodwork is free, which is not necessarily the case. A dirty house gives the bed bug an opportunity of establishing itself in the fabric. It is, therefore, of primary importance that habits of cleanliness should be taught. A thorough spring-cleaning carried out regularly with attention to those parts of the house which do not come under the ordinary cleaning will go far to help to eradicate this pest. Slight infestations have been entirely eliminated simply by thorough cleaning, partly by scrubbing with soap and water and partly by constant disturbance of the hiding places. While fumigation with hydrocyanic acid gas will kill 100 per cent. of the bugs and their eggs it will not prevent their return, and at present no deterrent is known. Therefore, any scheme for the elimination of the bed bug must be based on cleanliness.

The Ministry of Health Reports on Public Health and Medical Subjects, No. 72, on the bed bug, published by His Majesty's Stationery Office, 1934, price 1s., contains a detailed account of the bed bug, its life history, means of dissemination, methods of control and recommendations with regard to structures most fitted to resist bed bugs. It should certainly be purchased by all those interested in slum clearance work.

THE FLEA

Description and Causes of Infestation

In this country various species of flea are common: the human flea, *Pulex irritans* Linn.; the dog flea, *Ctenocephalus canis* Curtis; and the cat flea, *Ctenocephalus felis* Bouché; and occasionally the plague flea, *Xenopsylla cheopis* Rothschild.

The flea is a light brown insect which is flattened from side to side, without any noticeable constrictions; the hind legs are modified for jumping. Unlike the bed bug the flea feeds very frequently, and is usually carried on the body of its host. The young of the flea is a legless, hairy maggot, and lives upon organic debris, such as wool, fluff and hair that it finds in the cracks of floorboards, etc. When about to go into the resting or pupa stage it forms a cocoon which is often covered with particles of dust, grit, etc. The adult hatches out inside this cocoon and in empty houses may remain there for a long time before it emerges. Very often houses which are left empty form admirable breeding grounds and instances have occurred of workmen going in to decorate and being attacked by swarms of fleas. This is pro-

bably due to the adult emerging from the cocoon on feeling the vibrations on the floorboards when workmen enter. The flea does not travel far, and is normally carried from house to house by its host.

Results of Infestation

Xenopsylla cheopis, and perhaps other species, which infest the black rat is capable of picking up the bacilli of plague from infested animals and passing it on to man. It may do this in two ways: (*a*) it pierces the skin and sucks blood, at the same time excreting during the meal close to the puncture, and possibly almost on it when the meal is finished; the *Bacillus pestis* may thus be carried into the wound by scratching. (*b*) Often the *B. pestis* coagulates in a gelatinous mass, thus blocking the gut of the flea, and though the flea will ultimately die, it is none the less voracious and sucks up blood which, coming into contact with the mass of the bacillus, is regurgitated into the wound and causes infection. Plague is still prevalent in many of the ports of the world, though the black rat is not so common as previously in this country. The making of rat-proof buildings has tended to keep the sewer rat (an enemy of the black rat) out of houses, but does not always exclude the black rat, which sometimes gains access along telephone wires, etc. Therefore, the black rat may carry plague on ships from a plague-striken area to an alien port, enter buildings in the new country and transmit the disease to human beings by the agency of the flea. As recently as 1910 an outbreak of plague occurred in this country, and as long as the black rat and flea persist they are a source of potential danger.

Remedial and Preventive Measures

It is important to keep domestic animals free from fleas and to kill all fleas found singly in houses. If a room is seriously infested, flaked naphthalene or para-dichlorbenzene crystals should be sprinkled in quantities on the floor and the room shut up. Fumigation with sulphur and spraying with one of the light paraffin-basis sprays are also effective.

ANTS

Description and Causes of Infestation

The ant most usually troublesome in houses is *Moromorium pharaonis* Linn. This is a very small red ant which is often found in the basements and foundations of bakehouses, hospitals, etc. They infest larders and kitchens, feeding on a wide variety of human food. Ants are social insects leading a communal life. The founder of the colony is the queen, whose sole purpose subsequently is egg-laying.

Ants and Disease

Ants carry no disease, but their presence in human foodstuffs is objectionable.

Remedial and Preventive Measures

The best method of extermination is by the use of a poison bait; a formula that has often been used with advantage is :—

Poison

6 parts by bulk sodium fluoride.
2 „ „ fresh pyrethrum powder.
2 „ „ corn starch.

This should be sprinkled in the runways of the ants, care being taken that foodstuffs are not contaminated and that children and domestic animals have no access to the mixture.

A poison bait successfully used by the U.S. Navy in steamships (U.S. Naval Medical Bulletin XIX, 4 October, 1933) is as follows:—

Poison

Glucose	9 lb.
Water	9 pints
Tartaric acid (crystallised) ..	6 grams
Benzoate of soda	8.4 grams

Boil slowly for 30 minutes and allow to cool. Dissolve sodium arsenite (C.P.) 15 grams in half a pint of hot water (the sodium arsenite is very poisonous), and when cool add the poison solution to the syrup and stir well. Add 1¼ lb. of honey to the poisoned syrup and mix thoroughly.

The preparation is placed in small tin boxes, one side of which is indented to allow the ants to enter. The solution of arsenite is weak enough not to kill the ant until it reaches the nest. A returning foraging ant feeds 12 or 15 others, including young ants and queens, and in a few days the colony is destroyed. If the arsenical solution is too strong the worker is killed before it reaches the nest and its effectiveness is lost.

It should be remembered that arsenical solutions are particularly poisonous, and in storing, handling or using the mixture the greatest care must be exercised.

If the ants are gaining access from outside, grease-banding the house will help to check the nuisance.

COCKROACHES

Description and Causes of Infestation

There are two species common in this country. The common cockroach (*Blatta orientalis* Linn.) is a dark brown flattish insect, the male having wings which do not quite reach the end of the body; in the female these are reduced to mere rudiments. The German cockroach (*Blatella germanica* Linn.) is much smaller than the common cockroach, and the wings extend the full length of the body; it is sometimes known as "the steam bug," and is often found in laundries.

Cockroaches live in cracks and crevices in kitchens, bakehouses, restaurants, etc. They like the dark and will scatter for shelter if a light is turned on. They eat a wide variety of substances, including paper and leather, besides ordinary human food. They are probably introduced in packing material which has been stored in an infested warehouse or ship.

Results of Infestation

The damage done by the cockroach is mainly material. They are not considered to carry infectious disease. As they excrete over food they are not desirable in houses, and food may become tainted.

Remedial and Preventive Measures

It is advisable to "make good" cracks and crevices, particularly in skirtings; this can be done with a pulp of newspaper and size, with putty or cement mortar, whichever is suitable. Poison baits are the usual means of extermination. Suitable baits are: (1) Sodium fluoride, pyrethrum powder and starch, as given above, for exterminating ants; (2) equal parts of borax and sugar (or chocolate); (3) plaster of paris one part and sugar two parts. These baits should be sprinkled over the floor, but in the case of (1) care should be taken that children and domestic animals are not allowed near the mixture. Phosphorus and red-lead pastes can also be used, but these are dangerous to handle. The sprays suggested for bed bugs also are effective. Where infestation is very extensive, fumigation with sulphur or hydrocyanic acid gas may be necessary. Where it is slight, traps may be used consisting of jam jars containing beer and peeled banana and fitted with an inverted paper cone; means should be provided for the cockroaches to reach the top of the jar.

EARWIGS

Description

The earwig (*Forficula auricularia* Linn.) is an elongated insect which probably derives its name from the wing which, when unfolded, resembles the shape of the human ear. They do not as a rule fly, but have been known to do so. Some doubt exists as to the purpose of the large forceps at the base of the body; it is possible that these are used for purposes of defence or for folding up the wings.

Results of Infestation

While earwigs do considerable damage in gardens, they are merely a nuisance in houses.

Remedial and Preventive Measures

The Ministry of Agriculture and Fisheries suggest that a poison bait is probably the best means of exterminating earwigs in gardens, and recommend a bait much used in the United States and Canada which consists of:—

Poison

Bran	1 lb.
Sodium fluoride	2 oz.
Water	1 pint
Black treacle	4 oz.

The sodium fluoride should be dissolved in the water, the treacle added and well stirred in and the poison mixture then added to the bran until the whole is slightly moist. This bait is then scattered over the garden in the evening, and in wet weather would need to be repeated several times. Sodium fluoride is poisonous, and care should be taken in using it. To prevent earwigs entering the house the Ministry suggest that borax scattered along the base of the walls will prevent the insects from climbing up the walls and entering through doors and windows.

Where earwigs enter a house from an infested garden it may also be desirable to paint a grease-band on the house just above ground level to prevent their access to the interior.

CRICKETS

Description

The cricket (*Gryllus domesticus* Linn.) is a medium-sized winged insect with highly developed hind legs. The characteristic chirp is produced by rubbing one wing case or tegmen over the other. They normally live near hearths, hot pipes and similar warm places.

Results of Infestation

The cricket lives on crumbs and similar refuse and acts as a scavenger. In this respect it is beneficial and it does no damage whatsoever. They are often prevalent near refuse dumps as the decaying organic matter affords them a suitable breeding ground.

Remedial and Preventive Measures

If it is desired to destroy these insects the best method is to employ a poison bait. The formula containing sodium fluoride recommended for ants may be used or a formula as follows:—

Poison

Arsenite of soda (80 per cent.)	1 oz.
Crude sugar or treacle	12 oz.
Water	5 pints.

The sodium arsenite should be dissolved in a little boiling water and added to the sweet solution. Boiled rice or soaked bread should be treated with the above solution and placed near the cracks or crevices where the crickets occur. *It should be remembered that arsenical solutions are particularly poisonous and, in storing, handling or using this mixture, the greatest care must be exercised.*

PSOCIDS (BOOK-LICE AND THEIR ALLIES)

Description and Remedial Measures

Several species of these insects occur in houses in this country and one might mention the following, *Clothilla picea* Motsch., *Trogium pulsatorium* Linn., and *Liposcelis divinatorius* Müll.

These minute, soft-bodied insects, either light or dark in colour, are found in nearly all new houses and can move with great speed. They live on fungi and moulds and are present until brickwork and plaster have dried out. Thorough drying of the building will cause them to disappear.

SILVER FISH

DESCRIPTION

Lepisma saccharina Linn. is a delightful little insect, very prevalent throughout the country. It is silvery grey in colour, of nocturnal habits, and a very rapid mover. It lives in warm places such as around hot pipes, hot tanks, boilers and so on.

RESULTS OF INFESTATION

It seldom does any damage, living on starchy materials such as crumbs, paste from behind wallpaper where this has become detached, gummed substances, etc. In rare instances it may cause damage in endeavouring to get at starchy substances and has been known to attack artificial silks where these have been treated with starchy material. It usually acts as a scavenger.

REMEDIAL MEASURES

The silver fish is best exterminated by the bait suggested for ants—sodium fluoride, pyrethrum powder and starch.

WOOD-LICE

DESCRIPTION

Wood-lice (Isopoda) belong to a different class, Crustacea, which includes lobsters, crabs, barnacles and so on. They enter houses attracted by damp but do not do any damage. They are thus merely a nuisance.

REMEDIAL AND PREVENTIVE MEASURES

Remove causes of dampness in the building and see that heaps of stones (including rockeries) and garden refuse are removed from the immediate vicinity of the house. As a last resource a poison bait may be used, composed as follows:—

Poison

Coarse oatmeal	1 lb.
White flour	1 oz.
Paris green	1 oz.

This should be well mixed, placed in a wide-mouthed bottle and sprinkled near the haunts of the wood-lice through a perforated cork or lid. The mixture is poisonous and should not be touched with the hands.

Members seeking further advice on special cases of infestation are recommended to consult the Department of Entomology, British Museum (Natural History), Cromwell Road, London, S.W.7 (Telephone: Kensington 6323), or the Building Centre, 158, New Bond Street, W.1 (Telephone: Regent 2701), to which institutes we are largely indebted for the foregoing information.

WOOD-BORING INSECTS

The following information on the Death Watch Beetle Common Furniture Beetle and Lyctus Powder-Post Beetle has been largely derived from publications by the Department of Scientific and Industrial Research (Forest Products Research Laboratory) and is published by permission of the Controller, H.M. Stationery Office. Members seeking advice on special cases should consult the Forest Products Research Laboratory, Princes Risborough, Bucks. (Telephone: Princes Risborough 101).

THE DEATH-WATCH BEETLE

DESCRIPTION

The death-watch beetle (*Xestobium rufovillosum* De G.) derives its name from the tapping sound produced by the adults, audible during May and June, the mating period of the insects. The beetle measures from one-quarter of an inch to one-third of an inch in length. It is of a dark chocolate brown colour, but is coated with patches of short yellowish hairs which give it a variegated appearance.

RESULTS OF INFESTATION

It is believed that the life-cycle occupies from two to three years, or even longer. The beetles emerge in April, May or June and deposit their eggs in cracks, crevices, old exit holes or inside old tunnels in the wood. The larvæ or grubs emerge from the eggs after a period varying from two to eight weeks and start to burrow in the timber for a period of twelve to twenty-four months or longer. It is during this stage in the development of the insect that the damage is done to the timber. After a chrysalis stage of two or three weeks the adult beetle casts its pupal skin but remains in the pupal chamber until the spring of the following year, when it emerges leaving an exit hole about one-eighth of an inch in diameter.

Oak is the structural timber most commonly attacked; the beetle may be found in coniferous woods, but only when in contact with or in the neighbourhood of infested hardwoods. Sound, recently seasoned timber is not attacked. The work of the death-watch beetle can easily be distinguished from that of other wood-boring insects by the nature of the wood-dust produced by the grub. This consists of bun-shaped pellets.

REMEDIAL AND PREVENTIVE MEASURES

Damp, leaky or poorly ventilated wooden structures or parts of structures provide conditions favourable for the development of the beetle. It is therefore important in exterminating the beetle in a building to pay attention to weather exclusion and to improve the ventilation of the timbers as far as possible. In the case of lead-covered roofs, where the lead is in contact with the timber affected, the beetle in escaping from the wood may bore through the lead. When repairs are undertaken these holes should be looked for and made good. In new buildings or when replacing timbers in old buildings it is desirable to eliminate all oak sapwood since this is especially liable to attack. Many architects make a practice of

specifying that there shall be no sapwood in oak supplied to their buildings.

The undesirability of placing lead in contact with oak should be mentioned in this connection for another reason than its liability to perforation by death-watch beetle, namely, that the acids in poorly-seasoned oak have a corrosive action on lead. In time this may give rise to leaks and so provide suitable conditions for the insect. When repairing buildings in which oak is found in contact with lead, and particularly when new wood is being provided, it is desirable to insert an insulating paper between the two materials. (See Notes from the Information Bureau of the Building Research Station No. 118. Published in Supplement to R.I.B.A. JOURNAL, 6 August 1932.)

If unchecked, the beetle may so weaken structural timbers as to bring about risk of a collapse; but owners of ancient buildings where the beetle or its workings are found are sometimes quite unnecessarily frightened into undertaking expensive replacements of timber, when the structural strength of the old wood is still entirely adequate and when it is possible without great difficulty to treat the timber and arrest the progress of attack.

Attack by *Xestobium* may suddenly terminate before all the available timber has been destroyed. When considering the treatment of a building it is therefore desirable to determine as far as possible whether or not the insect is still alive. Some indication of the activity of *Xestobium* in a building can often be obtained by the discovery of beetles on the floor during the emergence period, April to June. Before treatment is undertaken a thorough inspection should be made by a competent entomologist in conjunction with an architect. The presence of fresh wood dust and the occurrence of fresh exit holes are useful indications of the presence of active insects, but it is often difficult to decide whether the dust or holes have been freshly made.

Complete extermination of beetles and grubs in a building is a slow process. There is no known substance that will be fully effective in one application. Repeated applications by brush or spray are necessary to overcome the difficulty of securing adequate penetration of an insecticide into the timber. Where discoloration of timber is of little consequence, ordinary creosote or creosote derivatives are the most efficient insecticides. This should be brushed on hot. Where discoloration is undesirable mixtures are recommended which contain such substances as dichlorbenzene, chlorinated naphthalenes or colourless creosote derivatives. There are a number of proprietary preparations on the market of which two or three are more efficient than the others. The following procedure is recommended by the Forest Products Research Laboratory:—

(1) Entire removal of as much infested wood as practicable.

(2) Removal of superficial bore dust from timber to be treated by use of a blower or vacuum cleaner.

(3) Application of insecticide by spray or brush between March and September. Annual applications over a period of four years are recommended.

(4) Inspection of treated timbers, annually in spring, for a period of years after treatment.

(5) Careful examination of all timbers used for repairs, to avoid reintroduction of the insect; sound, well-seasoned timber, free from sapwood, should be utilised.

THE COMMON FURNITURE BEETLE

DESCRIPTION

The common furniture beetle (*Anobium punctatum* De G.) is the insect chiefly responsible for the condition commonly known as "worm" in old furniture and panelling. The beetles measure from about one-tenth of an inch to one-fifth of an inch in length, and are reddish or blackish-brown in colour. The insect is clothed with a fine covering of short yellow hairs, and the wing covers are marked by well-defined rows of small pits or punctures. The length of the life-cycle of *Anobium* appears to vary from one to two years. The beetles emerge from the wood during the period June to August, and may then be seen crawling on walls, ceilings, windows, etc., and are specially active on sunny days. They are able to fly, and can, therefore, spread infection during this time.

RESULTS OF INFESTATION

The eggs are deposited in cracks on the surface of the wood, in the joints of furniture, and sometimes in old exit holes. When ready to emerge the young larvæ break through the base of the eggshell, thus gaining immediate entry into the wood, which they tunnel along the grain. As the larvæ feed and grow the tunnels become larger and no longer run only along the grain of the wood. The exit holes are made by the adult beetles, and are about one-sixteenth of an inch in diameter, approximately half the diameter of those made by the death-watch beetle.

There are few timbers, if any, which are immune from the attack of the furniture beetle. This insect occurs quite commonly out-of-doors in dead or dying parts of trees, and in gate or fence posts. Under such conditions the injury caused is comparatively unimportant. When, however, the beetle attacks the structural timbers of old barns, sheds and similar out-buildings, or old furniture, panelling, flooring, rafters, etc., in houses the damage may become serious. In the course of a few years a chair leg, or some similar portion of furniture, may be reduced to powder. Ply-wood is not immune from attack. The presence of piles of bore-dust of cylindrical or elongate

pellets is an indication of activity. The form of the dust is quite distinct from that produced by the death-watch beetle.

Remedial and Preventive Measures

There is no known substance which in one application will eradicate entirely the common furniture beetle from timber or furniture in which it is present. Repeated treatments by brush or spray are necessary. Where structural timbers in which discoloration is of no consequence are concerned, treatment with a high-grade creosote oil is recommended after removal of as much powdered wood as possible. As in destroying the death-watch beetle, it is necessary to see that the creosote is brushed on hot to as much of the timber affected as is possible, particular attention being paid to cracks and crevices.

In the case of infested furniture, where unpolished surfaces are to be treated it is often possible to eradicate the insect by painstaking applications of paraffin or turpentine, working the substance well into the wood with a brush. There are a number of proprietary insecticides on the market suitable for treatment of furniture, and several of these claim that they can be applied to varnished or polished surfaces without causing damage. Preparations containing dichlorbenzene, chlorinated naphthalenes or colourless creosote derivatives are among the most effective. In the treatment of furniture special attention should be given to joints and crevices, the undersides of chairs, backs of drawers, etc., where varnish or polish is absent, since in such places the insect lays its eggs.

Treatment by heat will also destroy the insect, provided the temperature of the deeper parts of the wood is raised to 130 degrees Fahr. This can be done in a timber-drying kiln, but care must be taken that moisture conditions are carefully adjusted. This is of particular importance where made-up furniture is to be treated.

Fumigation may also be used, but this process is dependent on the airtightness of the chamber in which the piece of furniture is treated. A large tightly-fitting box, a glass case, a tank or a small spare room may be used. The most effective gas to use for this purpose is hydrocyanic gas. This gas is *extremely poisonous* to man and should be used only by experts (see also remarks on Remedial and Preventive Measures under "The Bed Bug").

The use of the vapour of benzene, if precautions against danger from fire or lights are observed, has been suggested, but the degree of penetration is uncertain. The benzene is poured into shallow dishes or saucers and placed at the bottom of the container and left for some time. When the benzene has evaporated more should be placed in the dishes.

Carbon tetrachloride, which is not highly inflammable like benzene, and for that reason safer, may be used in the same way, except that, since the vapour is heavy, the dishes should be placed on shelves at the top of the container. Carbon bisulphide may be similarly used, but, mixed with air, is liable to form an explosive mixture.

The injection of mercuric chloride into the affected wood has been used, principally in treating furniture. The material is, however, extremely poisonous, and presents no particular advantages over the safer and cheaper proprietary substances.

The most effective time for the application of insecticides is during late spring and early summer, when larvæ and young beetles are near the surface of the wood. Treatment should be repeated not only at intervals during this time of year, but also for at least two years in succession.

In using new timber for structural purposes in a building treatment with creosote provides an effective method of preventing infestation by *Anobium*.

THE LYCTUS BEETLE

Description

The *Lyctus* powder-post beetles found in this country are of six species. The most abundant is *Lyctus brunneus*, an American species that has now become more abundant than the native *L. linearis* Two other American species found are *L. planicollis* and *L. parallelopipedus*. The adult beetles are small, somewhat flattened and elongate, varying in colour from reddish-brown to black and averaging one-sixth of an inch in length.

Results of Infestation

It is only since the war that the *Lyctus* problem in this country has assumed serious proportions. The importation just after the war of large stocks of American hardwoods which had accumulated introduced *Lyctus*, particularly *L. brunneus*, in large quantities. These insects appear now to have become firmly established, and though they have hitherto troubled the furniture trade more than the building industry, numerous cases have occurred of their inflicting damage to woodwork in buildings. It should be specially noted that only *new* buildings are attacked by *Lyctus*. In the case of one large and important building *Lyctus* was found active in an oak roof, panelling and furniture within two years of its completion. Eradication was expensive and troublesome.

Lyctus beetles lay their eggs in the pores of some hardwoods. Oak, ash, walnut and sweet chestnut, all of which have pores large enough to contain the eggs, are timbers most liable to attack. Coniferous woods fortunately are immune. Moreover, *Lyctus* confines its attentions to sapwood.

The beetles emerge in spring, in favourable conditions as early as February, and continue to issue throughout the summer and autumn. They fly readily and can thus

extend the range of their attack. On hatching from the egg the young grub begins to tunnel in the wood, feeding and growing from March to October. Little sign of the attack may be noticeable until the beetles emerge twelve months after they have hatched, and it is possible for them to eat away the sapwood of a piece of timber, leaving a thin and apparently undamaged skin of wood which can often be peeled off. Holes in the wood caused by *Lyctus* are nearly always a sign that infestation is of a year or more's duration. Small piles of wood dust on the surface or areas of dust just below the surface are indications of attack. The dust has a fine floury texture and can be readily distinguished from that associated with the death watch and furniture beetles.

Remedial and Preventive Measures

In the case of new wood it is desirable to specify that no sapwood shall be used. With oak this can easily be done and constitutes the best safeguard, since no material is then provided which *Lyctus* will attack; with walnut the elimination of sapwood is, however, almost impossible. The use of a pore-filling polish or varnish is a good preventive, but in the case of panelling the unprotected backs, or in furniture the unpolished undersides, should not be overlooked. A single coat of paint, varnish or linseed oil on these surfaces will suffice. This practice of closing the pores in new oak and walnut on both the exposed and hidden surfaces is probably a wise precaution to take in all new buildings.

Experiments have been made in the rendering of wood immune from attack by impregnating it with zinc chloride. This work is still proceeding and appears to be promising. Oak treated with zinc chloride takes on a slight pinkish colour, but its strength and working qualities are unimpaired.

Sterilisation by heat is effective for destroying *Lyctus*. A temperature of 130 degrees Fahr. maintained for 1½ hours under conditions of saturation in an ordinary timber seasoning kiln will effectively do this. The hardwood for a new building could be so treated by the timber merchant from whom it is purchased, and in the case of a costly building containing such timbers in large quantities this precaution would be well worth taking.

It is necessary to emphasise the point that the means of preventing infestation by *Lyctus* are cheap and easy to carry out when the building concerned is under construction, whereas they are difficult and expensive when the building is finished and occupied.

Where *Lyctus* is found established in a finished building measures should be taken similar to those for the Common Furniture Beetle. Again there is no treatment fully effective in one application, but *Lyctus* is easier to deal with by insecticides because it attacks sapwood only. The best time to apply insecticides is during spring and summer.

General Note on Infestation of Timber

In addition to the wood-destroying beetles discussed above there are other insects occasionally found in structural timbers, some of which may inflict damage. They are, however, so rare that it is not necessary to discuss them or to give remedial measures in this article. Where there is doubt as to the kind of pest in a particular case, reference should be made to the Forest Products Research Laboratory.

It is perhaps desirable to warn readers against confusion between attack by beetle and the ravages of timber diseases such as dry rot (Merulius lacrymans). The two are frequently confused. Dry rot is caused by a fungus and spread by means of spores which can be air-borne. While it is probable that most new timbers in a building contain spores of dry rot, they are rarely propagated except under favourable conditions, such as lack of ventilation, darkness and a certain degree of dampness. The most important step in eradicating dry rot is to cut out all affected timber, a procedure which is only occasionally necessary in cases of attack by beetle.

APPENDIX

Vermin and the Design of Buildings

The following Appendix has been contributed by the Technical Editor, in collaboration with the Building Centre.

The problem of preventing the transfer of vermin, particularly bed bugs, from demolished dwellings to new houses and tenements, is of no small importance. It is particularly necessary for the architect to see that possible hiding places in new buildings are reduced to a minimum.

Local authorities appear to be unwilling to make public the extent of infestation which has already occurred in new slum-clearance buildings. This is understandable, since the public (and the Press) seem to regard the presence of bed bugs in a building as a disgrace, whereas, in many cases, it is merely a misfortune. The problem is nevertheless a serious one for the local authority. Infestations as high as 60 per cent. of new houses in slum-clearance schemes have been noted.

The remarks and notes in this appendix are not given with the intention of exposing the unwillingness of local authorities to publish figures regarding infestation, but to

make known to architects the great importance of this aspect of slum-clearance work and to suggest means by which infestation of new buildings can be avoided. The facts are sufficiently clearly stated in the Report on the Bed Bug, published by the Ministry of Health.*

The principal causes of infestation are mentioned in the foregoing article. It will be seen that it is difficult to prevent infestation from one source or another, and it is therefore important that extermination in new buildings should be made as easy as possible.

Detail Equipment

One of the principal types of hiding place for the bed bug consists of the crevices left by shrinking woodwork. These include architraves, skirtings, picture-rails, window-boards, etc. It seems a desirable precaution to use as little woodwork as possible. Tile or cement rendering may be used for skirtings and window boards; picture-rails, where these are considered necessary, may be of stamped sheet steel set flush in the plaster and presenting a shallow groove which can be cleaned out (see Fig. 1).

Fig. 1.—Section of stamped steel picture rail, affording no hiding places for bed-bugs, which cannot be easily cleaned out. Steel skirtings and door trim, if bent or otherwise damaged, may afford good hiding places.

The use of picture rails in bedrooms should be avoided. Wooden door frames or linings may be linked to plaster by a strip of stout adhesive tape (similar to surgical plaster) which can be painted over; this will effectively close the gap caused by movement of the wood (Fig. 2).

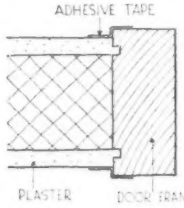


Fig. 2.—Horizontal section showing use of adhesive tape to close a potential hiding place for bed-bugs. If the frame is flush with the plaster, bugs will be more effectually excluded, but the job considered as joinery will not be good.

In the case of windows, double-hung sashes provide harbourage for bed bugs to a very much greater degree than do wooden casements; steel casements are best of all in this respect. All planted-on mouldings on windows and doors are undesirable owing to their tendency to move away slightly from the joinery to which they are fixed. Built-in furniture usually provides a series of hiding places highly favourable to the bed-bug.

In the fixing of permanent fittings such as cookers, baths, sinks, and particularly the pipes leading to and from them, it is necessary to see that hiding places are reduced to the minimum. Pipes and conduits are best fixed slightly free from the wall; where this is impossible they should be thoroughly chased into the wall under the plaster. The pipe fixed on a board plugged to the wall provides hiding places both behind the board and the pipe. The back edges of shelving should be about ½ inch clear of the wall surface.

Care should also be given to the fixing of light fittings and switches. The wooden block often used should be discarded in favour of a metallic or plastic unit. Wooden mantels to fireplaces are also undesirable.

Structure

Structural cracks caused by settlement or shrinkage afford good hiding-places for the bed bug. It is therefore desirable to use partition materials which will not shrink, and to take all measures to prevent settlement of partitions as units; the resulting crack at ceiling level is a good hiding place. While there is no evidence in support of the belief that wallboards encourage vermin in buildings, it is necessary so to fix them that no cavities are formed behind them and that open joints caused by moisture movement are effectively closed or protected. For example, in reinforced concrete structures wallboard may be safely used as ceiling or wall-facing if it is placed in the shuttering before the concrete is poured; the concrete adheres strongly to the wallboard, even overcoming the movement of the board due to changes in moisture content.

The problem of floors is a difficult one. Tongued and grooved floorboards, if closely cramped, help to exclude the bed bug from the interiors of wood joisted floors, but, if badly laid, particularly if the tongues have been broken, tongued and grooved boarding affords hiding places which are very difficult to clear. There is much to be said for the use of square-edged boarding, which, when it opens, leaves a gap that can readily be cleaned with a knife. There is no doubt, however, that all wooden floors, whether on joists or direct on concrete, are much more troublesome in harbouring bed-bugs than are solid floors finished with tiles, composition or lino (provided this last is properly cemented down).

A particularly undesirable form of cheap cottage floor is that in which wallboard is laid on the joists to form a ceiling below, the flooring being subsequently laid over the wallboard and nailed through to the joists (Fig. 3). The wallboard inevitably sags away from the boards, and a very good hiding place for bed bugs is thus provided. The use of pugging and other sound insulating devices and materials in floors is similarly undesirable, where these afford hiding places in much the same way.

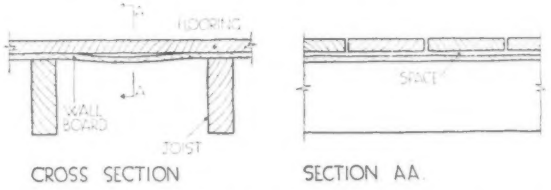


Fig. 3.—Sections of a cheap floor construction which, owing to the inevitable sagging of the wallboard ceiling, provides cavities that harbour bed-bugs.

* Report on the Bed Bug, No. 72, H.M. Stationery Office, 1s.

Book Reviews

RESEARCH ON HOUSING CONSTRUCTION*

BY B. S. TOWNROE, M.A., J.P., HON. A.R.I.B.A.

This Report has not yet received from all quarters the attention and study which it deserves. Admittedly several members of the Council for Research are intimately connected with commercial concerns, and their work in regard to housing has encountered some suspicion on the grounds that it has rather a flavour of advertising than of impartial study. This may be due to the fact that those parts of the Report which bear traces of industrial inspiration have been given undue prominence in comparison with the rest. In fact, however, the document in cogency of expression, collation of facts, and far-sighted recommendations is one of the most valuable contributions to the study of the housing problem that have been published during the last few years.

Any possible prejudice against investigating the possibilities of steel frame construction and the building of tenements ten storeys high ought to be set aside by every person who realises that the clearance of slums and the rehousing of slum families and of those who now live under overcrowded conditions cannot be accomplished satisfactorily on the old lines of policy, and that new and vigorous methods are essential.

The Council's Status

For several years past private investigations have been undertaken by the British Steelwork Association and Imperial Chemical Industries, Ltd., directed to the common end of reducing the costs of housing through the fuller use of modern structural methods and materials. After a time it was decided that the other main aspects of the housing problem—social, administrative, economic, financial, legal and architectural—ought to be examined at the same time in a properly co-ordinated scheme of work. In order to ensure this the Council for Research was inaugurated in June 1933, as a body of individuals acting in their personal capacities and not as representatives of other bodies. In the words of the Report: It is not claimed or suggested that the views and recommendations set out are any more than "the results of a conscientious and co-ordinated study by a body of individuals, severally experienced in some part or other of the housing field, and united by a common desire to assist in fulfilling the nation's needs."

Space in this review will not permit of giving the names of all those who have assisted in the first stage of the investigations, but reference must be made to the architects concerned. Mr. Francis Lorne [*F.*], of Sir John Burnet, Tait and Lorne, is a member of the Council, and Mr. W. G. Davies [*F.*], the City Architect of Sheffield, Mr. G. Topham Forrest [*F.*], the Superintending Architect of the London County Council, Mr. Leonard Heywood [*A.*], the Director of Housing of Manchester, and Mr. L. H. Keay [*F.*], the Director of Housing at Liverpool, acted in a purely consultative capacity without any responsibility for the conclusions or recommendations.

Mr. John Dower [*A.*] prepared and edited this Report. Even those who may disagree with some of the conclusions ought to give Mr. Dower full marks. The Report is a masterly piece of work, stating in the clearest possible language many complicated sets of facts. The inevitable weariness of anyone studying such a technical study is relieved by the admirable arrangement of the pages, and the photographs and plans set at exactly the right places.

After having read through practically every Regional Planning Report that has been published since the War, I venture to suggest that all town planners or architects who have to prepare Reports might wisely follow the example set by Mr. Dower in 134 pages of letterpress, followed by a brief summary of the conclusions and recommendations. But the man who attempts to skip the detailed chapters will miss much.

Housing History.

The first chapter deals with the national housing problem and is a moderate and non-controversial statement of past history. After giving a detailed summary of housing achievements from 1919 to 1923, the Report estimates that there will be a continued demand for 250,000 houses a year for at least five, and probably ten, years, and that this can be met without any difficulty, if building operations are carried through at the increased speed made possible by modern methods of mass production, standardisation and organised assembly of material.

The Council then deliberately limit their objective, stating that the remainder of the Report will deal mainly with the abolition of the slums, the abatement of overcrowding and the rehousing of persons so displaced. New housing, now left to unassisted and normally private enterprise, is to be examined in a future Report. The Council recognise that while an adequate reconditioning policy may be of great value, clearance in rebuilding, on a scale large enough to permit of thorough redevelopment of congested and ill-planned areas, will often be necessary. At this point the keynote of the Report is expressed in the following words:

> "While 60 two-storey cottages on a single acre inevitably produce an intolerable congestion, 60 dwellings in five-storey tenements on the same space can readily be planned without any congestion at all, and a corresponding development in ten-storey tenements gives a still more generous provision of public open space."

* *Slum Clearance and Re-housing—the First Report of the Council for Research on Housing Construction.* London: P. S. King. 10s. 6d.

Existing High Flats

There is then inset a photographic supplement showing by examples from London, Liverpool, Berlin, Leipzig, Hamburg, Paris and Rotterdam how tenement flats are being used to provide dwelling space for a dense population, and at the same time ample open space for playgrounds, public gardens and uncongested traffic routes. The French tenement schemes are those at Bagneux and Drancy, which have already been described in the R.I.B.A. Journal. It will be remembered that the system of construction adopted which was worked out by M. Mopin, a French engineer, is based on the use of a steel frame, to which are attached the walls, floors, roofs and partitions in large pre-cast reinforced concrete units of special design. The Rotterdam flats, nine storeys high, now in course of erection, are said to be perhaps the boldest experiment yet made in the technique of tenement building. The completion of the steel frame for the block of 72 flats in a total of three-and-a-half weeks' work is a demonstration of the increased speed made possible. In these flats steel sheeting backed by blocks of insulating material is being used for the facing of the outer wall.

An Economic Analysis

The second chapter is an economic analysis of housing with special reference to the rehousing of slum dwellers. Here the arguments are closely knit, but the conclusions can be thus summarised. All new tenement flats should satisfy certain minimum requirements, and their occupation should not exceed the rate of two persons per habitable room, subject to sex separation, except for married couples and children under ten. It is argued that the maximum permissible density in persons per room is not a constant, but increases with the family size. The average permissible density therefore depends on the relative numbers of families of different sizes in the area under consideration. Weekly rents of about 10s., inclusive of rates, are the highest which the lower-paid working class should be required to pay for flats of an average size of three rooms. After making allowance for rates (the variations in which are a very unsatisfactory factor in the housing question) and running costs, it is calculated that a 10s. rent is sufficient to cover, at the current rate of interest on municipal loans, a capital expenditure per flat of £285 without subsidy, and of £591 to £719 with subsidy at the present rate. This 10s. gross rent is only suggested as applicable to urban conditions, and is, of course, not within the unaided capacity of all slum dwellers.

The section on running costs is particularly stimulating. The Council have not accepted blindly the view that the Octavia Hill system of women management is necessarily the best under present conditions. It is suggested the social and rent-collecting functions might be separated. The social worker's first purpose must always be to get the confidence of the families under her care, and the work of rent collecting is bound to strain such confidence, especially when rent is in arrears. This is a matter on which a great deal more study would be useful for undoubtedly, in future housing, management will be recognised as of paramount importance.

Design and Construction

The third chapter is of special interest to architects, for it deals with the design and construction of tenements. The main reason why, in this country, tenement flats have up to the present cost considerably more to build than cottages of a corresponding type is that their design and construction have been quite inadequately studied. The old-fashioned block dwellings of pre-war days are bad and unpopular. But on the Continent the widespread use and popularity of tenements has encouraged close study and steadily reduced costs. The Report claims that the basis of progress and cost reduction in tenement building is to be found in the application of modern and rationalised building technique, based on the principles of standardisation, mass production, large-scale operation, organised assembly to strict time-schedules, a maximum working face, and a maximum speed of throughput. This chapter owes much to the two Reports issued by the Building Industry Council of Review, which has now become absorbed into the Building Industries National Council, and it would have been useful if readers had been referred to these two Reports so that, if they wished, the rather vague recommendations could be followed in more detail. But the salesmen of steel evidently demanded space at this point, with the result that there is a good deal of "boosting" of steelwork and the inevitable and justifiable attack upon the London Building Act and obsolete by-laws.

The conclusion of this chapter is that five-storey buildings will not be large enough in some of our industrial centres to prevent re-housing operations being seriously restricted or even coming to a standstill, through inability to cope with the density of population. Plans and elevations are therefore given of ten-storey tenements. The estimates state that blocks can be built under present conditions providing three-roomed tenement flats for approximately £318 in five-storey blocks, and £402 in ten-storey blocks. A warning is given that in some areas the amendment of obsolete building regulations may be required to achieve these prices, and critics consider that these estimates are unduly optimistic.

Useful details are given of such practical questions as the standardisation, layout and equipment of sanitary services, the simplified "one-pipe" or "one-stack" systems centralised hot water and heating and lifts. Possibly not enough emphasis is given to the many objections to ten-storey tenements, the "sole but vital advantage" of which is admitted to be that they are more economical in the use of land. It is of interest to note that the L.C.C. has decided to allow the Stepney Borough Council to erect ten-storey flats as an experiment.

Conclusion

The final chapter puts forward a certain number of recommendations, such as the extension of the power of compulsory purchase by local authorities to all working-class property, the operating of statutory town planning powers, the appointment of Housing Directors with powers over regional areas, and finally the setting-up of a permanent Advisory Council under the Ministry of Health charged with the investigation of all aspects of housing activities.

This chapter is decidedly vague and inconclusive. The impression left is that the various distinguished members of the Council each put forward their own pet theory, and that these have been thrown together in rather an undigested condition and dumped in the last part of the Report without due consideration being given to merits or demerits. For example an Advisory Council sounds very nice in theory; but all those who have studied the decline and fall of the many advisory bodies set up during the last fifteen years in Whitehall know that frequently they provide mere "eyewash," and are only summoned if required by the permanent Civil Servants. They provide an excuse for theorists to collect together and talk. The talk may be a useful smoke-screen for legislative action or inaction. But on this recommendation, as on others, the members of the Council for Research on Housing Construction appear to be rather out of their depth. Their views on steel and finance are clear-cut, but as soon as they touch local government administration their views are "fluffy."

In spite of such defects, this Report ought to be carefully studied by every one who appreciates the urgent necessity for the application of hard thinking and practical experience to the slum problem. It contains novel ideas, supported by persuasive arguments and, as stated above, is admirably written and put together.

Nevertheless, it seems regrettable that a body which is constantly talking about co-ordination is not more co-ordinated with existing bodies which are working on the same lines. There are a number of separate organisations each supported by men of enthusiasm who believe in the necessity of technical research in building. There is overlapping of effort and unnecessary expenditure of money. The public, who are the potential building owners, become confused by these competing bodies, the one praising steel, another singing the virtues of brick, another proclaiming the need of a building science, and yet another arranging for the organisation of research and information services. Allowing for the natural individualism of an Englishman, surely the necessity of providing better homes for our fellow countrymen is so urgent, and the need of helping unemployed builders to find work is so real, that we may trust that the men of generous heart and broad vision who are supporting the Council for Research and Housing Construction and other bodies will agree to co-operate more closely in the future.

SLUMS AND HOUSING

Housing and Slum Clearance in London. *By Hugh Quigley and Ismay Goldie. London. Methuen. 7s. 6d.*

The Social Importance of Housing Now and in the Future. *Internationale, Wohnungskongress, Berlin, 1931.*

The range of housing literature has been the monopoly of a few writers whose names represent the advanced attack upon bad housing conditions. Their books give colour, life and volume to shelves that bear a proportionately large number of thin reports; their writings are largely responsible for the formation of a public opinion on housing matters. It is not, however, an ungracious act to welcome a book written by two newcomers, and in their company to throw aside all the older approaches to the subject, to clear the issues again, and to indulge once more in an attack on a century-old problem.

The appeal of this book lies in its deliberate denunciation of private enterprise as the accepted medium for providing housing accommodation in this country. Instigated by the provisions of the 1933 Housing Act, and by the ever increasing chaos resulting upon individualistic land development, Mr. Quigley puts forth an earnest plea for the organisation and co-ordination of all communal services, to form a planned community. From analogy with health, educational and transport services, he points out that the time is ripe to accept Housing as a National concern, and housing of the poor as an accepted part of social economy. He goes farther to say that the whole sphere of the exploitation of land values, of speculation in building should be controlled and planned for the benefit of the community.

"Housing is in the final analysis no more a matter for private enterprise than the provision of essential public services. Housing does not mean the supply of houses for sale or for rent, but the provision of accommodation for the population adequate to modern standards of living, and such provision should not be entrusted to speculation or to the vacillations of private enterprise, any more than the provision of transport or of electricity or gas should be left to individuals competing with each other, without any control or any limitation. The public interest has placed an obligation on the railway companies, for instance, as common carriers to provide transport if the public requires transport. Similar obligations have been placed on water, gas and electricity, but there has been no public utility on which we can place the same responsibility with reference to housing. Now such an obligation is just as vital to the proper functioning of housing as of other utilities, but to do so would mean a change in conception; housing becomes a civic or national obligation and not the provision of a commodity for sale across the counter." Not only to provide for the poorest but "the provision of houses of all types should be under the supervision or should be subject to the sanction of a new Government body, which may be called the Ministry of Housing, with powers under the various Town Planning and Building Acts to decide the type of house, its location, its grouping, with other houses, its cost and everything associated with the provision of housing, particularly public services." A town planner's dream come true. Unfortunately Mr. Quigley is not a town planner and he leaves technical details to others. His aim is to convert; as propaganda his chapters are well worth putting before the public.

A book written by two authors is likely to suffer from disunity. This book is like a sandwich, in which Mr. Quigley's ardent peroration, and final summing up form the covering to Miss Goldie's survey of London's housing conditions. As in all good sandwiches, the satisfaction given is unity, though in the process of satisfaction the bread and the meat unwillingly part company. Mr. Quigley's first and last chapters form but a scarcely adequate covering to the excellent meat in Miss Goldie's chapters. Her history of London housing conditions is lively, though it might have been made more real if the material had been related to a greater extent to the other social services growing up contemporaneously. Of particular interest is her chapter on the "Uneconomic Tenant" in which she sums up the many-sided aspects of the problem of providing the poorest of the poor with a home, and with scope for civilised living. Difficulties always run in circles. The poorer the tenant, the greater the handicap placed on his obtaining decent accommodation. Miss Goldie claims that the only method of breaking the circle is to admit of social responsibility and to provide social aid in the form of a dwelling at an uneconomic rent. Educational and medical opinion will welcome the creation of a social service, without which both school teachers and doctors find their efforts vain.

The obvious waste in the execution of the social services will in all probability lead to a readjustment of the nation's budget. Attention that has till now been absorbed in the creation of moral well being will be transferred to the creation of well planned physical background to the nation's life. Such a transfer will not be made without the help of public opinion, and it is in the development of public opinion that such books as that of Mr. Quigley and Miss Ismay Goldie have an important influence.

To those less interested in propaganda and more in London statistics, it may be well to point out that the Mansion House Council on Health and Housing have recently published a pamphlet dealing with London statistics entitled "The Present Housing Situation in London." The figures given are much more complete than Miss Goldie's, and there is an interesting summary of the effects in Greater London of the migration of population according to the 1931 census.

Of the more recent publications on housing it will be of interest to note that a new edition of *A Hundred New Towns* has been issued. An explanatory plan has been added, and the financial details of the scheme have been enlarged upon.

In taking up the Report of the International Housing Congress on "the Social Importance of Housing Now and in the Future," we turn from propaganda to weighty facts, from historical narrative to a document of great importance in the history of housing. Plainly stated it contains the history of housing activities in Europe since the war, and will form an important reference to historians dealing with the period. Seen in the light of the present situation in England the document will be very valuable to those who seek methods of dealing with the national campaign.

Material was collected from most European countries by the Congress on the basis of a very interesting and elaborate questionnaire. Given such detailed guidance, one would expect a considerable amount of uniformity about the answers received from each country. In this respect the document is very disappointing. The reports vary greatly in thoroughness, and it will be very difficult to make effective comparisons from them, particularly where analyses of costs are concerned. It is characteristic that by far the most conscientious reports come from Germany, and that it is closely related to the questionnaire provided.

That the facts given are dated 1930 should not detract from the interest of the volume. The economic upheavals of 1929 caused a slowing up of house building everywhere. In Central Europe little additional work has been carried out recently, and where it has been done it has been executed after a change of policy. In England, too, the year 1930 is significant in connection with an Act that directs housing activity on new lines. The years 1918 to 1930 form a clearly defined period in housing history to which this volume will be a document of the first importance.

The questionnaire issued aimed at securing answers to two questions. The first asked whether it was possible for private enterprise to build for the working classes on a profit-producing basis. In all cases, except in Finland, the answer is no; the reason in practically all cases shows the impossibility of reconciling the demands of modern building standards with the working class wage, and deducing a profitable return from the result. The second question asks, "How can building enterprise best be organised to ensure that the need for small dwellings shall be met in a satisfactory way?" The reader will find a large field of investigation to hand. The English reader, in particular, will sift the information in the light of what seems to him to contribute to the discussion on the future of English housing policy. Seeing that in England there may be a considerable encouragement of the public utility societies, it is of interest to realise to what extent public utility societies, and co-operative building societies have been encouraged abroad, and by what means they have been given assistance. Each country has its individual methods of encouraging the builder either by tax or rates exemption, by law interest and mortgage rates, by an enlightened land policy or by subsidy, the particular method used having generally some relation to the financial stability of the country. On this subject the German report is the most comprehensive, whereas the English report is terse by the very nature of facts. On the Continent the municipalities have not considered financial aid a sufficient measure but have also aimed at retaining controlling influence over the societies, whereas in England "the State exercises no special control over the public utility societies receiving assistance in the provision of houses." Here there has been too frequent antagonism between the municipality and the local public utility society. Abroad the public utility society has been encouraged by the municipality as a means to avoid the problem of political influence. The unusual activities of the last decade have led to centralisation of these societies, and such organisations as the H.S.B. (Hyresgästernus Sparkasse-och Byggnadsförening) in Sweden have virtually become specialists on housing problems. In Germany the building societies have federated, and employ a large technical staff. In both countries the work of these societies has entirely superseded private enterprise. It is unfortunate that the reports of these countries are in German, and supply only a scanty English summary, for the discussion on housing policy is the most valuable part of the reports. The analysis of building costs, of rents, the comparison of place areas, etc., is more easily effected without a dictionary. The figures given cover some interesting comparisons between rent and income, land and building costs, and floor areas of dwelling rooms. In connection with land values it is encouraging to find that several countries have carried out character and density zoning in the towns in order to prevent the raising of land prices.

A general survey shows that no country except Holland has attempted to provide accommodation for the entire population, including the very poor. In Holland, not only is good accom-

modation found for the slum dweller but he is deliberately taught and trained to live in a civilised way.

A comparative analysis of the reports is to be issued later by the Congress. This will be essential to the proper understanding of the material. On the other hand, such comparisons may reveal the irregular standard of answer, whereby the value to be attributed to such methods of securing information is lowered. This objection, however, does not refer to individual reports which in nearly all cases supplies first hand information on housing methods used in the various countries.

J. G. Ledeboer [*A.*].

WINCHESTER STREET ARCHITECTURE

A Survey of the Street Architecture of Winchester. *By T. D. Atkinson. Winchester. 2s. 6d.*

Winchester, the ancient capital of England, deserves well of its historians, having been generous to them in the supply of material. The hollow among the chalk hills of Hampshire in which it lies is indeed the christening-bowl of the English nation, for from Winchester in the ninth century the name *English* first issued officially to spread throughout the length and breadth of the land. And many ideas in architecture, as in culture generally, the Normans and their successors imported to it direct from France through its port of Southampton, the port of unique position which by its superiority over Christchurch, the port of Salisbury, gave it the preference over that ancient rival.

Mr. T. D. Atkinson, in this most attractive little volume, has made a worthy record of the present aspect of Winchester streets, a record which one could wish were even more comprehensive, so pleasant is it both as to letterpress and illustrations. It is a direct if diminutive descendant of the record, begun in the same town eight and a half centuries ago, which dealt with the whole country, the Roll of Winchester, more familiar to us under the nickname of Doomsday Book given to it by those who foresaw in it the unpleasant possibilities of Land Valuation. But Mr. Atkinson threatens no owner, though he tactfully points out certain improvements which might be made in the appearance of street fronts, especially in the case of shops where the lettering is sometimes so large as to defeat its own purpose of being easily readable from the necessarily short distance allowed by a narrow street. His selection of buildings to comment upon and to illustrate could hardly be improved upon, though everyone would probably find one or two omissions of the picturesque to criticise—such as the old Dog and Duck inn, and inclusions of the unworthy—No. 110 High Street, for instance, with its heavy length of stone wall under the eaves carried apparently by the peculiarly weak-looking "half-timbering" of the storey below! It is unfortunate if unavoidable that a very expressive and dignified building designed by Mr. Atkinson himself for the Hampshire Friendly Society cannot be illustrated nor even seen as well as it deserves to be in Jewry Street; a sepia perspective, almost frontal, would have been fairer to it. On the same side of the street there are two hospitable-looking dwelling-houses in the warm red brick of the eighteenth century which might have found places in a larger volume; houses of a type whose charm, largely depending upon colour and proportion and, above all, on placid horizontal lines, brings to us, even without the environment of old trees and velvety lawns, a welcome sense of repose and a soothing reminder of less strenuous days.

Photography, which some still believe incapable of lying, falsifies occasionally, as in Plates 11 and 23, but represents as few artists would have patience to do, the beautiful *grille* before No. 54 Chesil Street, and completes a very delightful handbook which neither visitor nor resident in Winchester should be without.

R. Macdonald Lucas.

COMMON SENSE AND FURNITURE

English Furniture. *By John Gloag. (In series:—The Library of English Art). London. Black. 1934. 7s. 6d.*

The book is typical of the healthy modern outlook on design. The author very rightly directs his critical faculty as much to the antique as the modern. He is not impressed by age; he is in search of good proportion, taste and fine design. He points the way to a study and appreciation of English furniture which was unknown, except to very few, before the war, but now is fast developing at least in the younger generation—and that is where it should begin if it is to grow. The book is not so much for the serious student, it is not intended as a technical treatise but rather to instruct the general reader in a right appreciation of furniture both old and new. The main idea of its construction is to show "how English furniture design has since A.D. 1500 reflected the changes in national taste and how a tradition of comfort and comeliness has been maintained, whether furniture has been made from oak or mahogany or tubular plated steel or plywood."

This is an ambitious programme for 192 pages of text, but the author has tackled the problem by sketching the field of furniture design in its broader aspects, and has actually succeeded in squeezing in an amusing chapter on buying furniture.

The first two chapters are devoted to the historical background of design between 1500 and the present year. This, in the writer's view, is probably the most valuable section of the book, as instructing the reader in some of the political and sociological influences that must affect all the arts. The important relations with architecture are constantly stressed. It is but an outline, but it proves the necessity for serious study and due appreciation of relevant history for all who would assist the production of sound modern work in architecture and all related crafts.

Chapters 3 to 6 deal with the design of furniture from 1500 to 1900; here there is a tendency to go into details which is apt to cause distortion in an outline sketch, for the simple reason that once description of types and individual pieces is begun many questions must be dealt with, such as the inter-relation of materials and construction to development in design in order adequately to explain the real and complicated facts. This the author has not had space to do. He has on the whole steered a good course, but one feels that the novice will be jumping to all sorts of conclusions unless he read much more deeply. This indeed he is advised to do, for Chapter 10 is devoted to a talk about other books on furniture, which is much more helpful than appending a mere list. The trend of design is illustrated throughout the chapters by groups of small line drawings—too small to give an idea of anything but form, yet this they do with a genuine accuracy as one would expect from the pen of E. J. Warne. Thus there are no half-tones on "art paper" inter-leaved with the text—such are reserved for a frontispiece and for twenty-three plates bound together at the end, in which the illustrations range from a thirteenth-century chest in oak to steel tube and laminboard furniture of to-day.

From the commercial point of view the book is designed on very sound lines. People will pay 7s. 6d. without demur; and when works of this quality can be produced at so reasonable a figure it is evidence of the modern movement in publishing.

John C. Rogers [*A.*]

Review of Periodicals

Within the self-imposed limit of these pages attempt is made in this review to refer to the more important articles in all the Journals received by the library. None of the journals mentioned are in the loan library, but the librarian will be pleased to give information about prices and where each journal can be obtained. Members can have photostat copies of particular articles made from journals in the library.

CIVIC BUILDINGS

BUILDER. *Vol. CXLVI. No. 4769. 29 June.*
Plans for the Kingston-on-Thames Guildhall by Mr. Maurice Webb [*F.*] (Sir Aston Webb and Son).

BAUMEISTER. *Vol. XXXII. No. 6. June.*
A new Town Hall at Osnabrück to seat 4,000 persons. (Theo Burlage.)

VILLAGE HALLS

ARCHITECT AND BUILDING NEWS. *Vol. CXXXVIII. No. 3419. 29 June.*
E. and O.E. on Village Halls.

INDUSTRIAL

BOUWKUNDIG WEEKBLAD 1934. *No. 25. 23 June.*
A co-operative bakery at Haarlem, by A. M. J. Sevenhuysen.

OFFICES

BUILDER. *Vol. CXLVI. No. 4769. 29 June.*
The Chartered Insurance Institute, Aldermanbury (M. F. and O. H. Collins [*FF.*]).

ARKITEKTEN (COPENHAGEN). *Vol XXXVI. Nos. 3-4.*
Design for a large Insurance Office in Aalborg (Helweg-Møller, architect).

SHOPS AND MARKETS

ARCHITECTS' JOURNAL. *Vol. LXXIX. No. 2058. 28 June.*
Photographs, plan and working details of Timothy White's showrooms at Southsea (J. Emberton [*F.*]).

BULLETIN TECHNIQUE DE LA SUISSE ROMANDE. *Vol. LX. No. 13. 23 June.*
Plans of a scheme for a large covered market on several floors at Lausanne.

CINEMAS

ARCHITECTURAL RECORD. *Vol. LXXV. No. 6. June.*
The Small Cinema. A short article advocating the building of small cinemas rather than the usual vast Plaza-Astoria Palaces. Contains some useful information of design and planning.

EXHIBITION BUILDINGS

ARCHITECTURE (PARIS). *Vol XLVII. No. 6. 15 June.*
New buildings at the Paris Zoo designed by MM. Chaussemiche and Letrosne after visits to all the other leading European Zoos. The buildings are simple, all the imagination of the designers has been concentrated on the naturalistic open-air enclosures with ambitiously conceived rock-terraced caves and paddocks.

ARKITEKTEN (COPENHAGEN). *Vol. XXXVI. Nos. 3-4.*
Buildings for the 1933 Norwegian Exhibition at Aalborg by E. Glahn and C. Odgard.

MON. F. BAUKUNST U. STADTEBAU.
A good illustrated description of the "German Peoples'—German Work" Exhibition, Berlin. The motto, "There will be but one nobility—nobility of work." Buildings by von Arten.

HOSPITALS, ETC.

BUILDING (SYDNEY, N.S.W.). *Vol. LIV. No. 320. 12 April.*
St. Vincent's Hospital, Melbourne (Stephenson and Meldrum), one of the largest modern Australian hospitals, fully illustrated and described.

ARCHITECT AND BUILDING NEWS. *Vol. CXXXVIII. No. 3418. 22 June.*
Monkwearmouth and Southwick Hospital (W. and T. R. Milburn [*FF.*]). Very well illustrated, with an analysis of the equipment of the specialised departments.

ARCHITECTURAL RECORD. *Vol LXXV. No. 6. June.*
The remodelled buildings of the New York Ophthalmic Hospital.

ARCHITECT AND BUILDING NEWS. *Vol. CXXXVIII. No. 3419.*
Rugby School Sanatorium (Pite, Son and Fairweather [*FF.*]).

SCHOOLS

L'ARCHITECTURE D'AUJOURD'HUI. *Vol V. 4th Series. No. 4. May.*
Schools. A magnificent special number, illustrating and describing numerous very recent French school buildings, one large senior school at Lisbon and several in Greece. With a skill which is almost magical this paper invariably manages to find enough really good work to fill its 100 or so pages.

CONSTRUCTION MODERNE. *Vol. XLIX. No. 40. 1 July.*
Groupe scholaire at Paris by Roger Expert. A good modern building, including a nursery school and boys' and girls' schools. The design, construction and equipment are fully described.

BUILDER. *Vol. CXLVI. No. 4769. 29 June.*
Mayfield Central School, Ilford (Reynolds and Cavanagh [*L.*]).

ARCHITECT'S JOURNAL. *Vol. LXXIX. No. 2057. 21 June.*
Another of Mr. W. T. Curtis's [*F.*] Middlesex County Council Schools—at Northwood.

ARCHITECTURE ET URBANISME (BRUSSELS). *Vol. LIV. No. 5.*
Winning designs in a competition for a small school at Jette. School includes playground and gymnasium and solarium.

ARKITEKTEN (COPENHAGEN). *Vol. XXXVI. Nos. 3-4.*
Two schools at Aalborg communal village, by Ejnar Poulsen. Each good straightforward buildings; classrooms, lecture theatres, gymnasiums, etc.

BOUWKUNDIG WEEKBLAD. 1934. *No. 25. 23 June.*
A small Montessori school at Haarlem, by A. M. J. Sevenhuysen.

LIBRARIES

PENCIL POINTS. *Vol. XV. No. 6. June.*
Supplement of illustrated details of Bookshelves in private houses.

CONSTRUCTION MODERNE. *Vol. XXXIX. No. 39. 24 June.*
Pontoise Municipal Library (M. J. Ruillier), a small public library.

CHURCHES

ARCHITECT AND BUILDING NEWS. *Vol. CXXXVIII. No. 3418. 22 June.*
A new church hall to Temple Moore's magnificent church of

St. Wilfrid, Harrogate, designed by L. T. Moore [*F.*], a design notable for the construction of its roof, a trussless roof formed of 8 by 1½ inch Columbian pine pieces jointed in a self-supporting net-like pattern.

Construction Moderne. *Vol. XLIX. No. 38. 17 June.*
Illustrations from an exhibition in Paris of contemporary church architecture.

Architects' Journal. *Vol. LXXIX. No. 2057. 21 June.*
St. Barbara's Church, Whale Island (Welch, Cachemaille-Day and Lander [*FF.*])

Architect and Building News. *Vol. CXXXVIII. No. 3419. 29 June.*
The Reid Memorial Church, Edinburgh (L. G. Thompson[*A.*]). An excellent article by Mrs. Esdaile on Croome d'Abitot Church, one of the earliest Gothic revival buildings of the seventeenth century, designed by Capability Brown.

SYNAGOGUE

Arkitekten (Copenhagen). *Vol. XXXVI. Nos. 3-4.*
A synagogue at Aalborg.

SPORTS BUILDINGS

Chantiers. *Vol. II. No. 2. May.*
Form and technique in the design of sports buildings—a very useful series of articles on the design—chiefly from the technical point of view—of stadia, swimming baths, running tracks, illustrated by numerous good modern examples: dimensions of grounds necessary for about 20 leading sports are given.

SWIMMING BATHS

Baths and Bath Engineering.
The library now receives this journal of the National Association of Bath Superintendents.

Bygge Kunst. *Vol. XVI. No. 5. May.*
Bathing beaches—an excellently illustrated article on the Oslofiord beach and a description of the buildings at Ingierstrand—Restaurant, kiosks, etc.; by Ole Lind Schistad; good airy modern design entirely appropriate to purpose and surroundings.

Builder. *Vol. CXLVI. No. 4768. 22 June.*
Leyton Public Baths. Large covered pool, 120 feet by 42 feet and children's bath, 60 feet by 25 feet.

Journal of Institute of Municipal and County Engineers. *Vol. LX. No. 26. 19 June.*
Description of a new swimming bath at New Brighton, Wallasey.

Architect and Building News. *Vol. CXXXVIII. No. 3419.*
The vast new bathing pool at Brighton—area 6,500 square yards.

Design for Today. *Vol. II. No. 15. July.*
P. Morton Shand writes on inland bathing places; illustrations of numerous excellent Continental examples.

HOTELS AND INNS

Architectural Design and Construction. *Vol. IV. No. 8. June.*
A special number on public houses, with useful information about equipment and numerous illustrations and plans.

Architecture Illustrated. 1934. *June.*
The Three Fishes Hotel, Kingston-on-Thames (Joseph Hill[*F.*]), an ingenious corner site plan.

Architect and Building News. *Vol. CXXXVIII. No. 3418. 22 June.*
The Red Lion Hotel, Sunningdale (Faulkner & Aylwin [*FF.*]).

RESTAURANTS AND BARS

Architects' Journal. *Vol. LXXIX. No. 2058. 28 June.*

Architect and Building News. *Vol. CXXXVIII. No. 3419. 29 June.*
The Cave Man—a restaurant at the entrance to the Cheddar Gorge (Russell Page and G. A. Jellicoe [*A.*]).

Architectural Record. *Vol. LXXV. No. 6. June.*
A number of cocktail bars in various places in America.

Arkitekten (Copenhagen). *Vol. XXXVI. No. 3-4.*
A refreshment pavilion in the Aalborg public park, an open terrace of lattice and a large restaurant seating several hundred people.

HOUSING

Journal of the Royal Sanitary Institute. *Vol. LV. No. 1. July.*
The Technique of Rehousing, etc., from Slum Areas, by C. H. Walker, Housing Director, Bolton.

MATERIALS, EQUIPMENT, ETC.

Architectural Forum. *Vol. LX. No. 6. June.*
A special "Producers Progress" reference number, containing 260 notes on new building materials, methods of construction and equipment; the information is classified under Structure, Floors, Wall finishes, Partitions, Insulation, Roofs, Windows, Doors, Paint, Finishes and Waterproofing, Air conditioning, Oil burners, Plumbing, Electricity, Kitchens, Furniture, etc., etc.

Journal of the Institute of Heating and Ventilating Engineers. *Vol. II. No. 16. June.*
An article on Natural Ventilation, by F. S. Caink, comparing the efficiency of natural and mechanical ventilation and to explain the features and performance required by natural ventilators.

Architectural Record. *Vol. LXXV. No. 6. June.*
Fire control in the design of modern buildings. The report of tests made by the U.S. Bureau of Standards and others.

Chantiers. *Vol. II. No. 2. May.*
Article on the utilisation of natural air currents in Ventilation—description of the L. Petrovitch system.

Journal of the Royal Sanitary Institute. *Vol. LV. No. 1. July.*
Col. Hopkins's paper on Rural Drainage, which was reported in the Journal of 28 April, is published in full but without plans.

PROFESSIONAL PRACTICE

Architects' Journal. *Vol. LXXIX. No. 2058. 28 June.*
A clear exposition of the working of Architects' Advisory Panels, by Mr. A. L. Roberts [*F.*].

HISTORICAL AND GENERAL

A.A. Journal. *Vol. L. No. 568. June*
Full illustrated report of Dudok's paper to the A.A. on Buildings at Hilversum.

Journal of the British Society of Master Glass Painters. *Vol. V. No. 3. April.*
Articles on Essex glass painters of the Middle Ages by the Rev. Christopher Woodforde and a continuation of Mr. J. A. Knowles's series on the York school of glass painters, who also writes on mediæval stained glass designers.

Construction Moderne. *Vol. XXXIX. No. 39. 24 June.*
La Méthode d'Alberti, an article by M. A. Texier, chief architect of the department des Monuments Historiques, dealing with Alberti's method of composition.

Obituary

FREDERICK CHATTERTON [*F.*]

The sudden death in Fulham of Frederick Chatterton at the age of 62, on 16 June, deprived the Institute of a loyal and hard-working member. He was elected Associate in 1896 and Fellow in 1916. He was a member of the Literature Standing Committee in 1908–9, of the Practice Standing Committee from 1924–30, and again of the Literature Standing Committee from 1930 until the time of his death. He was a regular attender on any Committee to which he was elected, and though he was always more modest than was necessary for a man of his experience and ability, his opinions and advice were invariably listened to with respect.

Born in London in 1871, he was the third son of Mr. G. J. Chatterton of Derby. He studied privately, at the Royal Academy Schools, at the Regent Street Polytechnic and abroad. He was articled to Mr. J. T. Lee, and subsequently served as assistant in the offices of Mr. J. T. Micklethwaite, Surveyor of Westminster Abbey, and of Mr. Somers Clarke, Surveyor of St. Paul's Cathedral. About 1904 he went to South Africa, and practised first in Pietermaritzburg, Natal, where he built St. Patrick's Church; and then in Pretoria, where his work included houses and a warehouse. Returning to London after some two years overseas, he went into partnership with Mr. W. E. Couch, and work done by the firm at that time included offices in Lloyd's Avenue, Fenchurch Street, and a house at Bilbao, Spain. The firm also obtained the second premium in a competition for the Emergency Hospital at Ilford. Other buildings designed by Chatterton at various times included studios at the Camden School of Art and 15 Woburn Square, London, and "Alvaston," Chelwood Gate, Sussex.

In 1909 he was appointed lecturer in Building Construction and Quantities in the architectural school attached to the Egyptian Government School of Engineering at Giza near Cairo, and remained in Egypt for ten years. In 1912 he joined the architectural staff of the Ministry of Public Works in Cairo and stayed there until his resignation in 1919, but during 1918–9 he served for a time as R.E. Shipping Officer at Kantara on the Suez Canal. It was in Egypt that he met Miss Julia Cooke Watson, a talented musical critic and composer, whom he married in 1914 and who survives him.

He returned to London in 1919 to become editor of *Specification* and continued that work until he resigned it a few months before his death. For the Architectural Press, the publishers of *Specification*, he also compiled *English Architecture at a Glance*, *Houses*, *Cottages and Bungalows*, and *Shopfronts*. He contributed numerous articles to the *Architectural Review*, the *Architects' Journal*, and the JOURNAL of the R.I.B.A. At the time of his death, he was about to begin important consulting work for a well-known firm of manufacturers. His favourite recreation was fishing, and up to the end he used to spend his leisure hours at Ruislip Reservoir.

It is difficult, even for an acquaintance of long standing, to write anything adequate about his genial and attractive personality. We first met exactly twenty-five years ago in the waiting-room of the Egyptian Government offices in Westminster, as "short-list" candidates from a large number of applicants for the educational post already mentioned, and my recollection is of a distinguished figure whose commanding presence doubtless contributed to his subsequent appointment. Nearly ten years later, we met again in Cairo, where his wife and he took a prominent part in organising entertainments for soldiers on leave or convalescent. After the War, he was a familiar figure at all Institute functions.

His executed buildings were not numerous, his literary work was chiefly of an editorial nature and therefore useful rather than striking, and he never went very far in the direction of draughtsmanship. But he was known to a great number of architects as a kindly man with a manner which combined dignity and charm to an unusual degree, a man who was well informed but never talked too much and who faced reverses, when they came, with cheerful courage. It has been said of him that he could even tell fishing stories without boring his friends. That rare distinction is accounted for by fundamental characteristics evident to all who knew him: his genuine unselfishness and simplicity of mind.

M. S. B.

S. HURST SEAGER [*F.*]

Past President of the New Zealand Institute of Architects

We regret to announce the death of Mr. Samuel Hurst Seager, C.B.E., President of the New Zealand Institute of Architects for the 1925-26 Session.

Mr. Hurst Seager, besides being a leader of the profession in his own country and an architectural scholar and author, is best known perhaps for his important pioneer research into the difficult problems of lighting picture galleries so as to avoid undesirable reflections from the face of glazed pictures. The three papers which he contributed to this JOURNAL in 1912, 1923 and 1924 form a landmark in the history of gallery design and it is probable that every designer of picture galleries since his first paper on *The Lighting of Picture Galleries and Museums* has been under some obligation to him. The "top-side" system which Mr. Hurst Seager advocated has become permanently connected with his name, and has been carried into effect in numerous galleries in this and other countries, notably in the Tate Gallery and in the Sargeant Art Gallery, Wanganui, New Zealand, which was the winning design in a competition of which Mr. Hurst Seager was assessor. Mr. Hurst Seager never claimed to have invented the method which he advocated, but

there is no doubt that without his research a much longer time would have passed before the advantages of the system were recognised. He succeeded in drawing attention to a problem which had been neglected by both gallery directors and architects and stimulating improvements which have been of great importance in the history of gallery design.

We hope to publish a fuller memoir of Mr. Hurst Seager in a later number of the JOURNAL.

JAMES GRAHAM FAIRLEY [*Retd. F.*]

Mr. James Fairley, who died on 6 April 1934, was one of the oldest members of the R.I.B.A. Born in 1846 he received his architectural training in an office in Edinburgh, and at engineering classes in Edinburgh University. From 1876 until 1915 he practised continually in Edinburgh, and had a partnership in Dundee as well with Mr. B. MacCulloch, C.E., which he entered into shortly after 1876. During the period when he practised in Edinburgh he was responsible for a number of churches, including Fountainhall Road Church and St. Patrick's Church in Edinburgh, St. Paul's Church at Leith, St. David's Church, Bathgate, and many village churches. He designed the new Academy at Linlithgow, the Girls' High School and two churches in Dundee, and numerous village schools in Midlothian. He retired in 1915 and undertook no work after that date with the exception of a church hall which he was asked to build near his home. He also held official positions at H.M. Office of Works both in London and Edinburgh.

Mr. Fairley was an enthusiastic lover of Edinburgh. He took a very keen interest in the question of the preservation of the old buildings in the city and belonged to a number of Edinburgh societies and clubs. He was a great traveller and had travelled extensively in Europe and up to the time of his death he was an indefatigable walker. He was elected an Associate of the Institute in 1877 and a Fellow in 1892.

Exhibition of the Work of Unemployed Architects

The Exhibition of the Work of Unemployed Architects, at present being held at No. 7 Bedford Square, was opened on Friday, 22 June, by Lord Snell, Chairman of the London County Council.

SIR GILES SCOTT (President), in opening the proceedings, said that the exhibition represented the effort of the architectural profession to deal with an unfortunate and unavoidable emergency, an effort of which it was justly proud. The scheme had been started under the presidency of Sir Raymond Unwin and had been loyally supported by the R.I.B.A. and its Allied Societies, the A.A.S.T.A., the A.A., the A.B.S. and the London Society. The funds collected had been spent in paying people for actual work done, work, moreover, that would not be done by anybody else. The work would have a lasting result: it showed what could be done in times of distress, and was of such importance that it should be carried on in prosperous times as well.

LORD SNELL said that it was a great personal privilege for him to be asked to open such an interesting and unique exhibition. The origin and growth of the work had already been described, but he would like to speak about its technical and social significance. Just as cathedrals are not only great technical achievements but are also the expression of a great view of life, so this exhibition represented more than mere technical efficiency. One of the saddest things about unemployment was its psychological effect upon men whose enforced idleness meant deterioration of their capacity for work and their technical skill. This scheme had kept men happy working at their own job, and by so doing had done them and the whole community a great service. The County Council had also played its part in trying to help its own unemployed architects during the period of depression. A fund amounting to over £800 had been collected, and over thirty architects had benefited during the two years.

Lord Snell then dealt in more detail with the technical side of the work exhibited, and of its general utility. He referred particularly to the work of surveying and zoning, which was of the utmost value to town planners and architects of the future. He also spoke of the work of measuring the little known buildings of the seventeenth and eighteenth centuries which, but for this scheme, would probably have disappeared without record in a few years, and of the new Tallis drawings of street elevations. He concluded by saying that this remarkable technical efficiency was only the outward manifestation of a great social spirit which had promoted and made possible the whole scheme. This spirit could not be exhibited, but it was there all the same. He congratulated Mr. Maurice Webb and Mr. Percy Lovell for their work of organisation, and the architects themselves on the high standard maintained throughout the exhibition. He had much pleasure in declaring the exhibition open.

LORD CRAWFORD, in proposing a vote of thanks to Lord Snell, referred humorously to the unusual and effective way in which the work had been displayed. He said that it represented a long and laborious effort, and was of inestimable constructive value. He could envisage no new problem concerning the planning of London which could be solved without reference to the type of work initiated so successfully in this scheme, and for that reason, he said, the work must be carried on. He concluded by appealing for support for the continuation of the work under a permanent scheme now being formulated by the Architects' Unemployment Committee. This scheme would be entirely dependent on voluntary contributions and donations, and if this vital work was to be carried on the fund must be generously supported.

Correspondence

SIR IAN MACALISTER

Crabtrees, The Common,
Berkhamsted, Herts, and
43, Bedford Row,
London, W.C.1.
June 25, 1934.

To the Editor, JOURNAL R.I.B.A.,—

DEAR SIR,—The arrival of the JOURNAL this morning reminds me of one more thing left undone which I should have done—I did not write to MacAlister, as I intended, to congratulate him on his knighthood. May I be allowed to do so in the pages of the JOURNAL, because it will enable me to bring in certain other details which should be noted.

Assuming that MacAlister had served us as faithfully as he has in the fat comfortable period of, say, 1851 onwards, he would still have deserved his knighthood—but what are the facts of the case? He came to us 26½ years ago—as one puts the date down the mind goes back to a different world. Ebenezer Howard had founded Letchworth in 1903, but John Burns had not brought in his 1909 Town Planning Act, and we had to wait till 1910 for our own Town Planning Congress. Bleriot was to fly the Channel in 1909. The Great War was to alter the face of Europe and desolate the whole world, and we did not know that it was to be followed by a disastrous Peace. On two occasions MacAlister has had to organise methods of assisting distressed architects.

Somehow or other we have scratched through, and the old R.I.B.A. is still going strong. Some part of the credit for this is due to the good Secretary, who has given to each succeeding Council the benefit of the continuity of his experience. One of these days MacAlister must write his memoirs and deposit them in the Library—I know one Fellow who might find them useful.

Yours truly,
C. H. B. QUENNELL [*F.*].

PROFESSOR FRANK GRANGER'S VITRUVIUS

11 Gray's Inn Place,
W.C.1.
28 June 1934.

To the Editor, JOURNAL R.I.B.A.,—

SIR,—I think that Mr. Gloag is, perhaps, unnecessarily disturbed. In reviewing the new *Vitruvius* the 1860 edition of Gwilt's translation was referred to for a reason that appeared self-explanatory. The title page of my own copy describes it as "a new edition, carefully revised by the translator," and it embodies some changes and corrections upon the original issue.

Even 1860 is a fairly long way off, so that Professor Granger gives us none too soon this much needed and admirable rendering of an indispensable work.—Yours faithfully,

FREDK. R. HIORNS.

Notes

MR. KENNETH M. CLARK [*Hon. A.*]

Mr. Kenneth Clark, M.A. [*Hon. A.*], has been appointed Surveyor to the King's Pictures in succession to Mr. H. C. Collins Baker, who is retiring.

THE PRESIDENT

Many members will have seen with pleasure that Sir Giles Scott has been appointed Architect to the Bodleian Library.

PRESIDENT'S ENGAGEMENTS

Sir Giles and Lady Scott will attend an evening reception at the Royal College of Surgeons on 11 July.

VICE-PRESIDENT'S ENGAGEMENTS

Mr. Maurice E. Webb attended the reception and lunch organised by the Council for Research on Housing Construction at the Grosvenor House Hotel on 19 June, and the banquet of the Insurance Institute of London on 29 June.

Mr. H. S. Goodhart-Rendel attended the dinner of the Merchant Taylors' Company on 25 June.

SIR IAN MACALISTER

As an expression of their pleasure at the honour recently conferred upon him, the junior members of the R.I.B.A. staff have presented Sir Ian MacAlister with an inscribed silver calendar to stand on his office desk.

MR. B. J. WATERHOUSE

The Council of the Royal Australian Institute of Architects have elected Mr. B. J. Waterhouse [*F.*] to represent the R.A.I.A. at the R.I.B.A. centenary celebrations in the Autumn.

COURTAULD INSTITUTE OF ART: SUMMER COURSE IN THE HISTORY OF ART

The Summer Course in the History of Art will be held from 26 July to 31 August. The Main Course will be held from 26 July to 24 August and amongst other lecturers, Mr. Geoffrey Webb [*Hon. A.*] will give twelve lectures on "English Architecture." Excursions and visits to museums and galleries will be arranged as far as possible in connection with the lectures. The Supplementary Course (24 August to 31 August) will be devoted to a series of regional studies of English Art with special reference to the local conditions which have shaped art in different parts of the country.

Lectures will include:

Architecture and the Physical Structure of England. (One lecture.) Mr. A. K. Wickham, M.A. (author of *The Villages of England*).

The Northumbrian Stone Crosses. (One lecture.) Professor D. Talbot Rice, M.A. (Watson Gordon Professor of Fine Art in the University of Edinburgh).

The Architecture of the Cotswolds. (Two lectures.) Professor D. Talbot Rice, M.A. (Watson Gordon Professor of Fine Art in the Unitversity of Edinburgh).

The Church Architecture of Northamptonshire and Rutlandshire. (One lecture.) Mr. J. G. Mann, M.A., B.Litt., F.S.A. (Deputy Director of the Courtauld Institute).

East Anglian Architecture. (Three lectures.) Rev. W. Lillie, M.A., F.S.A.

The English Country-House. (Two lectures.) Mr. Geoffrey Webb, M.A. (Demonstrator in Fine Art in the University of Cambridge).

London Architecture at the time of Wren and his followers. (Two lectures.) Mr. Geoffrey Webb, M.A. (Demonstrator in Fine Art in the University of Cambridge).

Excursions will include visits to: City Churches and City Companies' Halls, Salisbury Cathedral, and to appropriate Museums and Galleries.

The fee for the main course will be £5 5s., and for the supplementary course 10s. 6d. *The supplementary course cannot be taken unless the main course is taken.* For some of the excursions an extra fee to cover travelling expenses will be payable. Admission to single lectures or visits to galleries, etc., 3s., plus any fee payable for the excursion.

Application for admission should be made to the Secretary of the Summer Course, Courtauld Institute of Art, from whom all details can be obtained.

INTERIM REPORT OF THE SOCIAL COMMITTEE ON OFFICIAL ARCHITECTURE

The announcement with reference to the interim report of the Special Committee on Official Architecture, published on the last number of the JOURNAL, lacked a preliminary paragraph stating that the report of the committee, which is sitting under the chairmanship of Sir Raymond Unwin, was approved by the Council on 18 June.

THE NATIONAL JOINT COUNCIL FOR THE BUILDING INDUSTRY

WAGES RATES

The National Joint Council for the Building Industry have issued a useful tabulation of districts' gradings and current wages rates in the Building Trade for all England. The information is simply and clearly arranged, first alphabetically by towns and then divided regionally. The names and addresses of the employers and the operatives' regional secretaries are given. The price of the pamphlet, which can be obtained from the Clerk to the Council, 5, Duke Street, Adelphi, is 6d., post free.

CORRECTION

We regret that on p. 801 of the last issue of the JOURNAL, the name of Mr. G. Thrale Jell, the designer of the Piccadilly Arcade, was incorrectly given as Thrale Fell.

SCHOOL NOTES

THE WELSH SCHOOL OF ARCHITECTURE, THE TECHNICAL COLLEGE, CARDIFF

The South Wales Institute of Architects, in conjunction with the Welsh School of Architecture, arranged a most successful exhibition of the R.I.B.A. Prize Drawings in the Studios of the Welsh School of Architecture, Cardiff, on Thursday, 21 June. In addition to the prize-winning drawings, the exhibition included the preliminary competition drawings for the Tite Prize and Soane Medallion.

At the Annual Sports of the Cardiff Technical College held on 12 May 1934, on the College Grounds, Cardiff Castle, the students of the Welsh School of Architecture played a prominent part, winning for the second time in succession the H. H. Merrett Shield awarded to the Department winning the greatest number of events.

In the Department events the Welsh School of Architecture was placed first in both the Swimming Squadron race and the tug-of-war, and third in the relay race.

In the individual events, students from the school won the mile and half mile championships, and in swimming they won the diving, the 100 yards and the 40 yards championships.

Allied Societies

ESSEX, CAMBRIDGE AND HERTFORDSHIRE SOCIETY OF ARCHITECTS

ANNUAL DINNER

Over sixty members and guests attended the annual dinner of the Essex, Cambridge and Hertfordshire Society of Architects at the Town Hall, St. Albans, on 16 June. The retiring President (Mr. Percival C. Blow) was in the chair and was accompanied by Mrs. and Miss Blow.

The Chairman congratulated Sir Ian MacAlister upon the honour of knighthood conferred upon him.

The toast of "The Royal Institute of British Architects" was proposed by Mr. H. C. Hughes, who referred to the fact that the "Mother Institute" had attained her hundredth year. She was the repository of the tradition of the profession, and had stored up in her memory all those changes of style and temperament which had taken place during the past hundred years. He coupled with the toast the name of Mr. Goodhart-Rendel.

In reply, Mr. Goodhart-Rendel said they wished the Institute, with which the allied societies were so closely bound up, many happy returns of her centenary. The organising body of such a profession as theirs must in its nature combine the function of a learned society and a trade union. It was doing both those things through its great architectural library, which was recognised as the best in the world, and its constant propaganda in favour of the principle of architectural competitions. Those were but two instances of the service which the Institute was rendering to the community in general.

Mr. O. H. Cockrill, this year's President of the Society, proposed the toast of "The City of St. Alban." St. Albans, he said had great past traditions, but its City Fathers were also building with an eye to the future.

The Mayor of St. Albans (Mr. F. G. Warwick), in reply, said his Council realised that its action to-day would become the history of to-morrow. St. Albans was expanding in all directions and the great concern of the governing body was to preserve its amenities. In that respect, it looked to such societies as theirs to help it to provide buildings of beauty, so that those who followed on might be proud o the traditions they inherited.

The work of the recently-formed Architects' Registration Council was outlined by Mr. Duncan W. Clark in giving the toast of "The Council."

Major Barnes (Chairman of the Registration Council), who made an amusing speech in reply to the toast, said there was a feeling among the public, which was becoming more pronounced, that architects ought not to be allowed to place more ugly buildings about, and he believed that the Registration Act would help in that respect. The Registration Council stood at the gateway of the architectural profession to admit men of capacity and "deport undesirable aliens."

Mr. T. Ottaway (President of the St. Albans Ratepayers' Association) proposed the toast of "The Essex, Cambs. and Herts. Society of Architects." He mentioned the controversy which had arisen over the proposal of the London Passenger Transport Board to place a garage in the heart of St. Albans, and stated that the retiring President and another member of the profession had been instrumental in enabling a serious protest to be made against it. As a result, and with the aid of the City Council, he was confident that the spoliation of a great part of the city would be prevented.

Mr. Percival C. Blow, in reply, said the Society existed to protect its members, but it felt that part of its duty was to educate the public in architectural taste. With that object in view during the last session, public and school lectures were given on architectural subjects. A Panel of Architects had been formed and was prepared to give honorary assistance to any Council that sought its advice. He urged Local Authorities to consider seriously the adoption of the model clause for the control of elevations. There had also been formed a

Consultative Board of Architects and Builders which he believed would be a useful means of settling disputes between them and enable them to get into closer touch.

Proposing the toast of "The Guests," Major H. P. G. Maule (Chairman of the Hertfordshire Chapter of the Society) said they had present that evening the four elements which made up the team in the community necessary to produce good building. If the architects, builders and civic authorities backed up by the public set their minds to it there was no earthly reason why they should not improve to an enormous extent buildings both private and public which disgraced the towns and boroughs.

Mr. Stanley Hamp (President of the Berks, Bucks and Oxon Architectural Association), who replied, after congratulating Mr. Blow upon his successful year of office, said the architecture of the countryside was deplorable. In that connection he appealed to the civic authorities to take full advantage of the opportunities offered by the Panels of Architects.

Mr. Arthur J. Arnold (President of the Eastern Federation of Master Builders), who also responded, said the architects had been as much to blame as the builders for the ugly architecture of to-day inasmuch as they had been lax in coming out of their shells. They were now realising how very important their duties were to the community.

Between the toast a clever conjuring entertainment was given by Mr. Cyril Shields.

EDINBURGH ARCHITECTURAL ASSOCIATION

At a recent meeting of the Edinburgh Architectural Association Mr. James Arnott [*F.*], the retiring president, delivered his valedictory address, taking as his title "Sowing and Reaping, or Progress." Speaking of the "harvest of fruit and flowers" yielded of recent years by the architectural profession, Mr. Arnott spoke at some length of the importance and significance of the Architects' Registration Bill, and the effect it will inevitably have on the solution of such problems as the employment of unqualified architects by local authorities, county and private institutions. He also referred to the fact that in the future it is hoped that all plans submitted to the Local Authority for Building Warrant will have to be prepared by fully qualified architects. With regard to the "harvest of beauty" he looked forward to the time when art and amenity, at present chased away by science, will again be reunited. He spoke of the potential beauty of Edinburgh, and of the many mistakes and missed opportunities in the past which had contributed to spoil one of the finest cities in the world. He saw, however, optimistic signs of improvement in the attitude of authorities and citizens to the preservation of the amenities of the city. In conclusion Mr. Arnott spoke of the valuable contribution the Edinburgh Architectural Association had made to this architectural harvest in the past and would continue, with the help of its Associate and Affiliate section, to make in the future. The Association had twenty-five years to complete before its centenary, and its obligations were becoming increasingly great.

Membership Lists

ELECTION OF MEMBERS

[Election: 2 July 1934]

In accordance with the terms of Bye-laws 10 and 11 the following candidates for membership were elected at the Council Meeting on Monday, 2 July 1934.

AS FELLOWS (6)

ELKINGTON: GEORGE LEONARD [*A.* 1905].
GIBBS: THOMAS HARRY [*A.* 1902].
SAXON: FREDERICK CHARLES, M.C., P.A.S.I. [*A.* 1918], Chester.
WRAY: KENNETH FLETCHER [*A.* 1925], Hastings.

And the following Licentiates who have passed the qualifying examination:—

LAWRENCE: FREDERIC WILLIAM, Bournemouth.
SPINK: JOHN WILLIAM, Kingston-on-Thames.

AS ASSOCIATES (17)

BERWICK: KATHLEEN RACHEL HARTLEY, B. Arch. (Lvpl.) [Passed five years' course at the Liverpool School of Architecture, University of Liverpool. Exempted from Final Examination]. Cambridge.

CAVANAGH: HOWARD ERNEST BERNARD [Passed five years' course at the Architectural Association. Exempted from Final Examination].

CORNU: PAUL EUGENE [Passed five years' course at the Architectural Association. Exempted from Final Examination].

GARRARD: GEORGE EDWARD JAMES WILFRED [Passed five years' course at the Birmingham School of Architecture. Exempted from Final Examination]. Sutton Coldfield.

HUTCHESON: WILLIAM ROBERT [Passed five years' course at the Architectural Association. Exempted from Final Examination]. Berkhamsted, Herts.

JONES: DAVID MORGAN, B.Arch., Dip.C.D. [Passed five years' course at the Liverpool School of Architecture, University of Liverpool. Exempted from Final Examination]. St. Dogmaels, Cardigan.

KEIGHLEY: GILBERT ALEXANDER [Passed five years' course at the Architectural Association. Exempted from Final Examination]. Keighley, Yorks.

MEIRING: ADRIAAN LOUW, B.A. (Cape Town), B.Arch. (Lvpl.) [Passed five years' course at the Liverpool School of Architecture, University of Liverpool. Exempted from Final Examination], Rondebosch, S. Africa.

MUNRO: JAMES, Dip.Arch. (Aberdeen) [Passed five years' course at the School of Architecture, Robert Gordon's Colleges, Aberdeen. Exempted from Final Examination], Fyvie, Aberdeenshire.

NAUDÉ: DAVID FRANÇOIS HUGO, B.Arch. (Lvpl.) [Passed five years' course at the Liverpool School of Architecture, University of Liverpool. Exempted from Final Examination], Cape Town.

OLDACRES: MISS RUTH MARY [Passed five years' course at the Architectural Association. Exempted from Final Examination], Woking.

PARK-ROSS: IAIN [Passed five years' course at the Liverpool School of Architecture, University of Liverpool. Exempted from Final Examination].

POWERS: FREDERIC WALTER [Passed the qualifying Examination approved by the Board of Architectural Education of the Institute of South African Architects], Durban, South Africa.

PRICE: JOHN CECIL BURNETT [Passed five years' course at the Bartlett School of Architecture, University of London. Exempted from Final Examination].

SIDBOTTOM: JOHN GRISEDALE [Passed five years' course at the School of Architecture, Leeds College of Art. Exempted from Final Examination].

WHILE: GEORGE HUNT [Passed five years' course at the Birmingham School of Architecture. Exempted from Final Examination], Sutton Coldfield.

WILSON: DAVID MARSHALL MILLWOOD [Passed five years' course at the Bartlett School of Architecture, University of London. Exempted from Final Examination].

ELECTION OF STUDENTS R.I.B.A.

The following were elected as Students R.I.B.A. at the meeting of the Council held on 18 June 1934:—

ALBARN: EDWARD, "Lulworth," Hinckley Road, Leicester Forest East, Nr. Leicester.

ANDERSON: GEORGE JOHNSTONE, 84 Gray Street, Aberdeen.
BROWNRIGG: JOHN EDWARD ANNESLEY, 48 Drayton Gardens, London S.W.10.
CRONJÉ: JOHANNES IZAK, 34 Bedford Square, London, W.C.1.
CULLEN: THOMAS GORDON, 132 Green Lanes, Stoke Newington, N.16.
DEW: RAYMOND MARCUS, 100 Rusthall Avenue, Bedford Park, W.4.
DRYSDALE: AGNES MARY, Hethersett, Crieff, Perthshire.
GIBBONS: KATHLEEN, Eaton Villa, Clifton Down, Bristol.
GRANT: DOUGLAS ADSHEAD, Althorpe, Cowley Hill, St. Helens, Lancs.
GROSE: HERBERT JOHN, 57 Earl's Court Square, London, S.W.5.
HANCHET: SIDNEY JAMES, 70 Chester Road, Highgate, N.19.
HENDRIKZ: WILLEM DE SANDERES, Vernon House, Park Place, London, S.W.1.
JAFFREY: GEORGE, 545 Clifton Road, Aberdeen.
JONES: JOHN CUTHBERT, 1A Castellain Road, London, W.9.
MCDERMOTT, LEONARD HUGH, Rowonmere, Edwin Road, Rainham, Kent.
MCFADYEN: JAMES SAMUEL, Barclays Bank (D. C. & O.), 111 St. Martin's Lane, Trafalgar Square, London, W.C.2.
MARTIN: JOHN EDWARD, Arnwell, Banchory Devenick.
MILLS: DAVID HOPE, 45 High Street, Beaconsfield, Bucks.
ODDY: GEORGE INGLEBY, 187 Old Church Road, Chingford, E.4.
PILCHER: DONALD ELE, Abney House, Ferndale, Tunbridge Wells.
PITCHFORD: KENNETH, 11 Hill View Avenue, Pasture Lane, Chapel Allerton, Leeds.
PLAYER: HAROLD NEVILE, 29 Crowther Road, Mirfield, Yorks.
PRYDE: DONALD IAN, 49 South End Close, London, N.W.3.
PURSER: JOHN MAURICE, 54 North Row, Park Street, London, W.1.
RIDLEY: ARTHUR JAMES, 102 Kenmure Street, Glasgow, S.1.
SCOTT: HENRY EDWIN, 5 Abbotsford Place, Aberdeen.
SMITH: ALFRED EDWARD, 38 Ladysmith Road, Enfield, Middlesex.
SMITH: KATHLEEN DORIS, Middleheath Garage, Redington Road, Hampstead, N.W.3.
SMITH: SYDNEY WALTER JOHN, 40 Ashbourne Grove, Dulwich, S.E.22.
STENNER: WILLIAM RAYMOND, 17 Redland Park, Bristol.
TATLOW: ALAN, 31 Portinscale Road, Putney, S.W.15.
TORRENS: RICHARD MICHAEL, 15 Fitzroy Square, London, W.1.
TRIGGS: JULIET MABEL, Little Boarhunt, Liphook, Hants.
VAN STUWE: HENDRIK WILLEM CAREL REYNEKE, 34 Alwyne Road, Wimbledon, S.W.19.
WARREN: FRANCIS JOHN DAMON, c/o 34-36 Bedford Square, London, W.C.1.
WRIGHT: DEREK SELBY, 12 Saxe Coburg Place, Edinburgh.
WRIGHT: JOHN BERNARD, 105 Cross Flats Grove, Beeston, Leeds, 11.

Notices

R.I.B.A. DANCE CLUB

Under the auspices of the Social Committee the R.I.B.A. Dance Club has organised a farewell dance to take place at the Institute on Monday, 16 July, from 9 till 2. This will be the last social gathering at 9 Conduit Street.

Tickets 5s. each, can be obtained on application to Mrs. J. A. Slater, 8 Wellgarth Road, London, N.W.11. Members wishing to be present are requested to apply on or before TUESDAY, 10 JULY, as no tickets can be issued after that date.

(In response to widespread suggestions a cabaret is being dispensed with and the price of tickets has accordingly been reduced from 7s. 6d. each.)

MEMBERS AND PROFESSIONAL AFFIXES

The Council's attention has been called more than once to the practice, among some members, of adding a string of letters of doubtful value to the affix indicating membership of the Royal Institute on their letter paper.

This is a matter in which the Council obviously cannot dictate to members, and must trust to their good sense. It should be obvious, however, that the affix of a chartered body of high standing is weakened in effect by the addition to it of a string of other mysterious designations, some of which probably indicate no more than the payment of an annual subscription.

COMPETITIONS

The Council and Competitions Committee wish to remind members and members of Allied Societies that it is their duty to refuse to take part in competitions unless the conditions are in conformity with the R.I.B.A. Regulations for the Conduct of Architectural Competitions and have been approved by the Institute.

While, in the case of small limited private competitions, modifications of the R.I.B.A. Regulations may be approved, it is the duty of members who are asked to take part in a limited competition to notify the Secretary of the R.I.B.A. immediately, submitting particulars of the competition. This requirement now forms part of the Code of Professional Practice, in which it is ruled that a formal invitation to two or more architects to prepare designs in competition for the same project is deemed a limited competition.

ANNUAL SUBSCRIPTIONS

Members' subscriptions, Students' and Subscribers' contributions became due on 1 January 1934.

The amounts are as follows:—

Fellows	£5 5 0
Associates	£3 3 0
Licentiates	£3 3 0
Students	£1 1 0
Subscribers	£1 1 0

NOTE.—By a resolution of the Council dated 20 July 1931, the subscriptions of R.I.B.A. members in the transoceanic Dominions who are also members of allied societies in those Dominions are reduced to the following amounts as from 1 January 1932:—

Fellows	£3 3 0
Associates	£2 2 0
Licentiates	£2 2 0

COMPOSITION OF SUBSCRIPTIONS FOR LIFE MEMBERSHIP

Fellows, Associates and Licentiates of the Royal Institute may become Life Members by compounding their respective annual subscriptions on the following basis:—

For a Fellow by a payment of £73 10s. (70 guineas).

For an Associate or Licentiate by a payment of £44 2s. (42 guineas), with a further payment of £29 8s. on being admitted as a Fellow.

In the case of members in the transoceanic Dominions who are members of allied societies in those Dominions, the following basis will operate:—

For a Fellow by a payment of £52 10s. (50 guineas).

For an Associate or Licentiate by a payment of £31 10s. (30 guineas), with a further payment of £21 (20 guineas) on being admitted as a Fellow.

Provided always that in the case of a Fellow or Associate the above compositions are to be reduced by £1 1s. per annum for every completed year of membership of the Royal Institute after the first five years, and in the case of a Licentiate by £1 1s. per annum for every completed year of membership of the Royal Institute, with a minimum composition of £6 6s. in the case of Fellows and £4 4s. in the case of Associates and Licentiates.

NEW CLASSES OF RETIRED MEMBERS

Under the provisions of the revised Bye-law No. 15 applications may now be received from those members who are eligible for transfer to the class of "Retired Fellows," "Retired Associates," or "Retired Licentiates."

The revised Bye-law is as follows:—

"Any Fellow, Associate or Licentiate who has reached the age of fifty-five and has retired from practice may, subject to the approval of the Council, be transferred without election to the class of 'Retired Fellows,' 'Retired Associates,' or 'Retired Licentiates,' as the case may be, but in such case his interest in, or claim against the property of, the Royal Institute shall cease. The amount of the annual subscription payable by such 'Retired Fellow,' 'Retired Associate' or 'Retired Licentiate' shall be £1 1s. 0d., or such amount as may be determined by resolution of the Council, excepting in the case of those who have paid subscriptions as full members for thirty years, and who shall be exempt from further payment. A 'Retired Fellow,' 'Retired Associate,' or 'Retired Licentiate' shall have the right to use the affix of his class with the word 'Retired' after it, shall be entitled to receive the JOURNAL and *Kalendar*, shall be entitled to the use of the Library, and shall have the right to attend General Meetings, but shall not be entitled to vote. A 'Retired Fellow,' 'Retired Associate' or 'Retired Licentiate' shall not engage in any avocation which in the opinion of the Council is inconsistent with that of architecture. Nothing contained in this Bye-law shall affect the rights of persons who at the date of the passing of this Bye-law are members of the classes of 'Retired Fellows' and 'Retired Members of the Society of Architects.'"

THE LICENTIATESHIP OF THE R.I.B.A. AND THE ARCHITECTS (REGISTRATION) ACT

The Council have decided that after 31 December 1933 no applications for admission to membership as Licentiates will be considered unless the candidates' names have been entered on the Register of Registered Architects.

NEW BUILDING MATERIALS AND PREPARATIONS

The Science Standing Committee wish to draw attention to the fact that information in the records of the Building Research Station, Garston, Watford, is freely available to any member of the architectural profession, and suggest that architects would be well advised, when considering the use of new materials and preparations of which they have had no previous experience, to apply to the Director for any information he can impart regarding their properties and application.

THE NATIONAL ASSOCIATION OF WATER USERS

Members are reminded that the National Association of Water Users, on which the R.I.B.A. is represented, exists for the purpose of protecting the interests of consumers.

Members who experience difficulties with water companies, etc., in connection with fittings are recommended to seek the advice of the Association. The address of the Association is 46 Cannon Street, London, E.C.4.

OVERSEAS APPOINTMENTS

When members are contemplating applying for appointments overseas they are recommended to communicate with the Secretary R.I.B.A., who will supply them with any available information respecting conditions of employment, cost of living, climatic conditions, etc.

Competitions

BELFAST: MEMORIAL ASSEMBLY HALL

The Governors of Methodist College, Belfast, invite architects resident in Ireland to submit in competition designs for a new Memorial Assembly Hall in the grounds of the Methodist College.

Assessor: Mr. R. S. Wilshere [*F.*].
Premiums: £100 and £50.
Last day for questions: 2 July 1934.
Last day for receiving designs: 31 August 1934.

BELFAST: SANATORIUM EXTENSION

The Tuberculosis Committee of the Belfast Corporation invite architects who have been resident in Northern Ireland since 1 March 1933, to submit in competition designs for an extension and improvements to the Municipal Sanatorium at Whiteabbey.

Assessor: Mr. R. S. Wilshere [*F.*].
Premiums: 500, 200 and 100 guineas.
Last day for questions: 28 April 1934.
Last day for receiving designs: 31 July 1934.

DUDLEY: PROPOSED NEW SCHOOL

The Local Education Authority of Dudley invite architects resident or having an office within a radius of 15 miles of Dudley to submit in competition designs for a new elementary School to be erected on the Wren's Nest portion of the Priory Estate.

Assessor: Mr. Herbert T. Buckland [*F.*].
Premiums: £150, £100 and £50.
Last day for questions: 7 May 1934.
Last day for receiving designs: 16 July 1934.

SWINDON: PROPOSED TOWN HALL EXTENSION

The Town Council of Swindon propose to hold a competition for Extensions to the present Town Hall, and Mr. A. B. Knapp-Fisher [*F.*] has been appointed by the President of the R.I.B.A. to act as Assessor. Conditions have not yet been drawn up.

SWINTON AND PENDLEBURY: NEW MUNICIPAL OFFICES

The Swinton and Pendlebury Urban District Council invite architects of British nationality to submit in competition designs for new Municipal Offices.

Assessor: Mr. James R. Adamson [*F.*].
Premiums: £150, £100 and £75.
Last day for questions: 11 June 1934.
Last day for receiving designs: 17 August 1934.

TUNBRIDGE WELLS: NEW CIVIC CENTRE

The Corporation of the Borough of Royal Tunbridge Wells invite architects to submit in open competition designs for a new Civic Centre to be erected on a site in Calverley Parade. The units comprising the scheme are as follows:—

(*a*) Council suite and Municipal Offices.
(*b*) Assembly Hall.
(*c*) Police Station and Police Court.
(*d*) Fire Brigade Station.
(*e*) Public Library and Municipal Museum.

Assessor: Mr. E. Berry Webber [*A.*].
Premiums: £300, £200, £100 and £75.
Last day for questions: 6 July 1934.
Last day for receiving designs: 22 September 1934.

WOLVERHAMPTON: MUNICIPAL ASSEMBLY HALLS

The Corporation of Wolverhampton invite architects of British nationality, resident in the British Isles, to submit in competition designs for new Municipal Assembly Halls.

Assessor: Mr. C. Cowles-Voysey [*F.*].
Premiums: £350, £250 and £150.
Last day for questions: 21 May 1934.
Last day for receiving designs: 1 October 1934.

COMPETITION RESULT

VENESTA STAND COMPETITION

The premium of £100 for a preliminary design for a stand for Venesta Limited at the Building Trades' Exhibition has been awarded to:—

Mr. F. Skinner, c/o Tecton, 57, Haymarket, London, S.W.1.

The four premiums of £10 each have been awarded to:—

Messrs: A. N. Baldwinson, A.R.A.I.A., 12 Bedford Place, W.C.1.
George H. Bray, A.R.I.B.A., 61 Curzon Street, W.1.
Thomas Gordon Cullen, 132 Green Lanes, Stoke Newington, N.16.
Jack Howe, 176 Baker Street, Enfield, Middlesex.

The Assessors of the competition were: Mr. H. de Cronin Hastings, (Editor of *The Architects' Journal*); Mr. W. L. Wood, (Editor of *The Architect and Building News*); Mr. W. T. Plume, (Editor of *The Builder*); Mr. E. Maxwell Fry, A.R.I.B.A., nominated by the Editor of the *Architectural Review*; Mr. Henry Rutherford, Managing Director of Venesta, and Mr. John Gloag.

Members' Column

PARTNERSHIP WANTED

Member with wide experience of industrial, commercial, and residential work in England, America, and the East, seeks partnership in established practice in England. Capital available.—Box 3064, c/o Secretary R.I.B.A.

DISSOLUTION OF PARTNERSHIP

Mr. Thomas Gibb [*L.*] and Mr. Edwin Smith [*A.*] have dissolved partnership by mutual consent. Mr. Gibb will practice in his own name at Post Office Chambers, Port Talbot (Telephone 70). Mr. Smith has become a partner in the firm of Messrs. S. Cym Jones and Arnold, architects and surveyors, Great Western Chambers, Neath (Telephone 125).

ARCHITECTS' DESK FOR SALE

Mrs. Arthur Messer, Little Widbury Hook Heath, Woking, wishes to dispose of an architects' oak roll-top desk in excellent condition, 5 feet long by 2 feet 9 inches deep, with easel prop for drawing board. Desk can be seen at Messrs. Tubbs and Messer, F.R.I.B.A., 64, Victoria Street, S.W.1. Price on application.

CHANGE OF ADDRESS

The address of Mr. S. Douglas Meadows [*F.*] in future is 55 Whitehall, S.W.1 (Office of the Commissioner of Crown Lands). Tel.: Whitehall 3400. Exten. 290.

LADY SECRETARY WANTED

Junior lady secretary required. Shorthand-typing and general business experience essential.—Box 5734, c/o Secretary, R.I.B.A.

Architects' Benevolent Society

PENSION AND FAMILY PROVISION SCHEME FOR ARCHITECTS

The provision of an adequate pension when working days are over has been a matter of grave concern to the professional man since interest rates on gilt-edged and other safe stocks have fallen with no immediate prospect of recovery. There was a time when a few thousand pounds meant comfort, but those days have gone, and the scheme of pension and family insurance outlined below makes its appearance at a most opportune moment.

The scheme has been formulated by the Insurance Committee of the Architects' Benevolent Society and is available to all members of the R.I.B.A. and its Allied and Associated Societies. An adequate pension can be secured, fixed in amount, and in every way guaranteed, together with the benefit of a widow's pension, payable for life and similarly guaranteed, if the member does not reach retirement age.

The scheme is designed on the broadest lines and the member without dependants may take advantage of the pension benefit alone or the pension can be commuted for a cash sum if desired.

Benefits under the Scheme

The benefits under the scheme include:—

(1) A Member's Pension, which may be effected for units of £50 per annum, payable monthly and commencing on attainment of the anniversary of entry nearest to age 65. This pension is guaranteed over a minimum period of five years and payable thereafter for the remainder of life.
(2) The Beneficiary's Pension, payable as from the anniversary mentioned in Benefit No. 1, but to the widow (or other nominated beneficiary) if the member dies before age 65. The amount of this pension is adjusted in accordance with the disparity between the ages of the member and his wife.
(3) Family Provision. Under this benefit a payment of £50 yearly is made to the dependant from the date of death of the member prior to age 65 until attainment of the anniversary previously mentioned, after which Benefit No. 2 becomes available.

Provision can be made for any number of units (of £50 per annum) up to a maximum of £500 per annum.

By adopting a scheme which is limited to members of the architectural profession, the Committee has been able to secure more advantageous terms than would be obtainable by members individually.

Members are entitled to claim rebate of Income Tax on their periodical contributions to the scheme both in respect of pension and of family provision benefit.

A leaflet is enclosed with this number of the Journal and full particulars of the scheme will be sent on application to the Secretary, A.B.S. Insurance Department, 9 Conduit Street, W.1.

R.I.B.A. JOURNAL

Dates of Publication.—1934.—21 July; 11 August; 8 September; 13 October.